



Environment & Society Portal



The White Horse Press

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Global Environment 7/8 (2011): 50–97

Since the 1980s, scientific experts have made a number of recommendations for averting food insecurity and famine in Northern Ghana and other dryland areas of West Africa. These studies are based on regional meteorological data, and their suggestions include early warning systems, smallholder agricultural development, and the depopulation of densely settled regions. Much of this literature posits two main hypotheses: that regional data can provide a reliable indicator of the potential for harvest failure, and that the recommended policy actions can work because they are new and innovative, without historical precedent. This article delves into the colonial past to challenge both of these hypotheses. Using Northern Ghana as a case study, we question the usefulness of regional data for understanding food insecurity, and we show that the supposedly novel ideas of the present in fact have a strong colonial lineage.

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Colonial Famine Relief and Development Policies: Towards an Environmental History of Northern Ghana

Jeff Grischow, Holger Weiss¹

Over the past fifteen years, Northern Ghana has been the target of researchers looking for tools to avert food insecurity and famine in times of drought. The proposed solutions include a number of policy actions, the most common being the development of early warning systems. In 1986, for instance, Ofori-Sarpong argued that the Meteorologi-



cal Services Department of Ghana needed more financial support to allow it consistently to produce regular weather observations for dissemination to farmers.² Beyond protecting against food shortages, these reports would enhance farmers' productivity by delivering timely data on meteorological conditions.³ Ofori-Sarpong returned to this point in 2004, this time in the context of a European-sponsored study on savannah livelihoods in dryland West Africa, recommending the development of early warning indicators for drought conditions.⁴ In the meantime, Lokko similarly emphasized information gathering as a basis for avoiding food insecurity.⁵ According to these authors, little was done between 1986 and 2004 to develop effective early warning systems, and Ofori-Sarpong and his team in particular clearly believe that such systems should remain a major priority.

In addition to early warning systems, other recommendations included support for smallholders, food relief schemes and relocating local populations. Twenty years ago Ofori-Sarpong highlighted irrigation as a necessary support for peasant farming in Northern Ghana, due to the unreliability of rainfall and its negative effects on the cultivation of millet, sorghum and groundnuts.⁶ Combined with early warning systems, irrigation schemes would encourage farmers to respond to market signals and intensify their agricultural production.⁷

¹ We would like to thank the anonymous readers as well as John Dargavel for their comments and criticisms of the original draft of this paper.

² E. Ofori-Sarpong, "The 1981-83 Drought in Ghana", in *Singapore Journal of Tropical Geography*, 7, 2, 1986, p. 126.

³ Ibid.

⁴ A.J. Dietz, D. Millar, S. Dittoh, R. Obeng, E. Ofori-Sarpong, "Climate and Livelihood Change in North East Ghana", in *The Impact of Climate Change on Drylands. With a Focus on West Africa*, T. Dietz, R. Ruben, A. Verhagen (eds), Kluwer Academic Publisher, Dordrecht/Boston/London 2004, p. 172.

⁵ C.R. Lokko, "Dimensions of Poverty and Famine in the Upper Eastern Region of Ghana", in *New Global Development*, 11, 1, 1995, p. 30.

⁶ E. Ofori-Sarpong, "The Nature of Rainfall and Soil Moisture in the North-eastern Part of Ghana during the 1975-1977 Drought", in *Geografiska Annaler. Series A, Physical Geography*, 67, 3-4, 1985, p. 186.

⁷ Dietz, Millar, Dittoh, Obeng, Ofori-Sarpong, *Climate and Livelihood Change in North East Ghana* cit., pp. 169-170.

However, for this to work in Northern Ghana, the government first would have to sponsor “agricultural depopulation” in the most densely populated areas. Ofori-Sarpong does not explain himself precisely, but he is no doubt referring to moving farmers out of overcrowded areas in order to maintain the carrying capacity of the land. The farmers left behind could then be encouraged “to store harvests from excess years” to be used in times of drought.⁸ Lokko has different ideas for farmer support, advocating better transportation networks and co-operative agriculture. He also favours government relief efforts, in which the state would co-ordinate resource distribution on the basis of data from early warning systems.⁹ Ofori-Sarpong rejects this idea, arguing instead that food aid should be sold rather than delivered through food-for-work, and traders be supported because they “perform key roles in a more commercially oriented food acquisition system... Food aid arrangements can easily undermine existing systems of commercial exchange of food”.¹⁰

Whether pro-market or state-driven, what is striking about these recommendations is that both authors present their famine prevention ideas as new and innovative. Writing of the response to famine in the Upper East region, for instance, Lokko comments that “the response has been confused and erratic. It was not until recently that relief program assessments have emphasized information gathering”.¹¹ Similarly, Ofori-Sarpong states that “it is recommended that monitoring studies *be started* ... to find easy early warning indicators of stress”.¹² Dietz and Millar make a similar argument about famine relief in the Bolgatanga area of the Upper East Region. “Food aid by government and NGO institutions”, they observe, “is a relatively recent phenomenon. It did not exist in and before the 1960s. In 1983

⁸ Ibid., pp. 169-70 and 172.

⁹ Lokko, *Dimensions of Poverty* cit., p. 30.

¹⁰ Dietz, Millar, Dittoh, Obeng, Ofori-Sarpong, *Climate and Livelihood Change in North East Ghana* cit., p. 172.

¹¹ Lokko, *Dimensions of Poverty* cit., p. 30.

¹² Dietz, Millar, Dittoh, Obeng, Ofori-Sarpong, *Climate and Livelihood Change in North East Ghana* cit., p. 172.

a major food aid operation brought in maize for the first time”.¹³ When history *is* invoked it is in the form of “tradition”, as in Ofori-Sarpong’s suggestion that “old traditions might be revived to try and store harvests from excess years”.¹⁴

Neither Lokko nor Ofori-Sarpong refer to the colonial period, despite the fact that virtually all of their recommendations – support for smallholders, improved transport networks, irrigation, government and private relief, food storage, and early warning systems – were tried at various times by colonial governments. Instead, what is to the fore in the writings of Ofori-Sarpong and other observers is the failure of the agricultural policies of the military regimes of the National Redemption Council (1972-75) and the Supreme Military Council (1975-78) during the 1970s. The baseline of these efforts was to promote irrigation and modernization projects, especially in the North. State-sponsored programmes, such as Operation Feed Yourself, “Arbour Day” (i.e., the planting of trees), or the Golinga and Nasia Irrigation Schemes in the Upper Region, were officially hailed as developing the North into the future breadbasket of the nation.¹⁵ While these efforts initially seemed to boost agricultural output, by the late-1970s it was evident that they had run into a cul-de-sac, partly due to the collapse of the Ghanaian macro economy, partly due to the effects of the 1970s Sahel drought but also, as other critical assessments have underlined, due to poor implementation and design.¹⁶ While the economic malaise and failure of the military government’s food and agriculture

¹³ T. Dietz, D. Millar (eds), *Coping With Climate Change in Dryland Ghana: The Case of Bolgatanga*, Netherlands Research Programme on Climate Change, Impact of Climate Change in Drylands (ICCD), Amsterdam/Tamale September 1999, p. 73.

¹⁴ Dietz, Millar, Dittoh, Obeng, Ofori-Sarpong, *Climate and Livelihood Change in North East Ghana* cit., p. 172.

¹⁵ *Ghana 1974: An Official Handbook*, Information Services Department, Accra 1974, p. 223. *Ghana 1976: An Official Handbook*, Information Services Department, Accra 1976, pp. 171-173. *Ghana 1977: An Official Handbook*, Information Services Department, Accra 1977, pp. 496 and 529.

¹⁶ J. Girdner, V. Olorunsola, M. Froning, and E. Hansen, “Ghana’s Agricultural Food Policy: Operation Feed Yourself”, in *Food Policy*, 5, 1, 1980, pp. 14-25. J. Goody, “Rice-Burning and the Green Revolution in Northern Ghana”, in *Journal*

policy created the conditions for a military coup d'état by Flt. Lt. Jerry Rawlings in 1979, the new civilian government under Dr. Hilla Limann (1979-81) was unable to tackle the structural crisis, which was followed by another coup by Rawlings in 1981. Although Rawlings proclaimed a "Green Revolution", the structural crisis of the country reached its nadir in 1983, when drought resulted in large-scale harvest failures in the North and famine conditions prevailed. The crisis led to a thorough reorientation of the Ghanaian economy and the introduction of World Bank Structural Adjustment Programmes.¹⁷ While annual harvest results have since then been positive, the national food policy has remained largely contested.¹⁸

From the above discussion it is clear that the policies advocated by Ofori-Sarpong in the mid-1980s came in response to the failure of agricultural development in Northern Ghana between 1972 and 1983. This failure in turn is often associated with the neglect of northern farmers by the first Prime Minister (later President) of Ghana, Kwame Nkrumah, between 1957 and 1966. Nkrumah's government did implement state-sponsored agricultural development projects, but they mostly focused on cocoa farming in the south or on mechanization and large-scale farming.¹⁹ Mechaniza-

of Development Studies, 16, 2, 1980, pp. 136-155. E. Hansen, "Public Policy and the Food Question in Ghana", in *Africa Development*, VI, 3, 1981, pp. 99-115. E. Ardayio-Schandorf, *Rural Development Strategies in Northern Ghana. Problems and Prospects for Reaching the Small Farmer*, Occasional Paper n. 18, Centre for Development Studies, Univ. College of Swansea, Swansea 1982. E. Hansen, "National Food Policies and Organisations in Ghana", in *The State and Agriculture in Africa*, N. Bourenane, T. Mkandawire (eds), Codesria Book Series, London 1987, pp. 42-54.

¹⁷ Hansen, *National Food Policies* cit., pp. 55-57. H. Alderman, G. Shively, "Economic Reform and Food Prices: Evidence from Markets in Ghana", in *World Development*, 24, 3, 1996, pp. 521-534.

¹⁸ K.P. Puplampu, "The State, Agricultural Policies and Food Security in Ghana (1983-1994)", in *Canadian Journal of Development Studies*, 20, 2, 1999, pp. 337-359. L. Awanyo, "Labor, Ecology, and a Failed Agenda of Market Incentives: The Political Ecology of Agrarian Reforms in Ghana", in *Annals of the Association of American Geographers*, 91, 1, 2001, pp. 92-121.

¹⁹ B. Beckman, "Ghana, 1951-78: The Agrarian Basis of the Post-colonial State", in *Rural Development in Tropical Africa*, J. Heyer, P. Roberts, G. Williams (eds), Bas-

tion included large-scale irrigation schemes in the North, but neither these schemes nor the state-owned mechanized farms had been realized by the late 1960s.²⁰ Benneh even argues that Nkrumah's agricultural policy in the North resulted in total neglect of the farmers – if a farmer did not belong to the ruling party there was little chance for him to get any technical assistance.²¹ It therefore appears that in Northern Ghana the agricultural schemes of the 1970s represented the first attempt by the government since 1957 to address the plight of the farmers. But it is important to note that what existed of a government agricultural development policy in the North during the 1960s – and by extension, one could argue, during the 1970s – were the remnants of various projects from the colonial period. These included, for example, irrigation schemes, and the Gonja Development Project, a failed attempt from the late 1940s to develop state-owned, mechanized groundnut production in the Northern Region.²² Nkrumah undoubtedly took his cue from the large-scale colonial projects but had no more success. On the other hand, Nkrumah's government failed to revive a lesser known but successful colonial initiative: the development of an early warning system for smallholder farmers beginning in 1948. Ofori-Sarpong and Lokko have resuscitated this idea, but without realizing its colonial roots.

In light of the above discussion, we believe that delving into colonial history can be of use to current debates over famine prevention in savannah zones. Our analysis specifically deals with British colonial policies for famine prevention and agrarian development in the Northern Territories of the Gold Coast (colonial Northern

ingstoke & London, MacMillan Press, Houndsmills 1981, p. 148. O.A. Akoto, "Agricultural Development Policy in Ghana", in *Food Policy*, 12, 3, 1987, pp. 243-254.

²⁰ Fao, *Land and Water Survey in the Upper and Northern Regions, Ghana, Final Report Vol. I. General*, Report prepared for the Government of Ghana by the FAO, Rome 1968.

²¹ G. Benneh, "The Response of Farmers in Northern Ghana to the Introduction of Mixed Farming: A Case Study", in *Geografiska Annaler: Series B, Human Geography*, 54, 2, 1972, p. 99.

²² See further J. Grischow, *Shaping Tradition. Civil Society, Community and Development in Colonial Northern Ghana, 1899-1957*, Brill, Leiden/Boston 2006, pp. 205-233.

Ghana). During the colonial period, food shortages were reported almost every other year. Before 1930 not much was done apart from reporting about the problems faced in various localities.²³ After this time, however, the colonial administration developed a series of policies aimed at preventing famine and increasing the productivity of smallholder farmers. The backbone of the colonial famine prevention system consisted of a system of monthly reports from a network of local officials. In narrating the story of these policies, we will address a number of questions: What were the causes of food insecurity in Northern Ghana between 1900 and the late 1950s? Were regional rainfall trends a good indicator of harvest failures? How effective were the colonial policies developed in response to periodic reports of drought and food shortages in the North? We will limit our case study to the later part of the colonial period (1940s and 1950s), as both the agrarian and the early warning schemes were developed during this period (although they began to be outlined as early as the 1930s). Addressing these questions will demonstrate the importance of the colonial period to current discussions of drought and food insecurity in dryland West Africa.

The environmental setting and rainfall patterns

Environmental conditions and climate constitute both the physical bases and the central external factors affecting not only annual farming cycle and harvest outputs, but also the demographic setup in Northern Ghana as elsewhere in West Africa. Agricultural development as well as any famine prevention system has to take into account the climate factor, especially local and regional rainfall patterns. This section starts with a short outline of the environmental and demographic conditions, then discusses regional rainfall conditions, and finishes by giving an outline of dry and wet periods in West Africa and Northern Ghana during the last century.

²³ See further H. Weiss, "Crop Failures, Food Shortages and Colonial Famine Relief Policies in the Northern Territories of the Gold Coast", in *Ghana Studies*, 6, 2003, pp. 21-36.

Northern Ghana: savannah vegetation, low population density and farming systems

Following a bioclimatic classification, Northern Ghana belongs to the subhumid savanna zone, where the mean annual rainfall is between 900 and 1200 mm and the growing season lasts between 140 and 190 days.²⁴ Agriculturally, the savannah is a fragile region, with “poor soils ... soil moisture deficits and low biomass production”.²⁵ Farming conditions in the region reflect the broad division of Western Africa into east-west vegetation zones correlated with regional north-south rainfall patterns, with wetter climates in the south and dryer areas in the north.²⁶ In Northern Ghana (see Map 1), the vegetation zones change around 10 degrees latitude (roughly the latitude of Tamale).²⁷ The regions below this line are part of the Sudano-Guinea (Northern Guinea) or forest savanna mosaic, encompassing a transitional area between the forest and the savannah. Above this line, the northernmost regions in the northwest (Lawra) and northeast (Bawku) belong to the Sudan savannah zone. The two regions support different staple crops: root-crops such as yams as well as maize in the southern and moister areas, and cereal crops such as different varieties of (early and late) millet (*pennisetum*) and (red and white) guinea corn (*sorghum*) in the northern and drier areas.²⁸ Rice cultivation on irrigated fields was introduced during the colonial period and became the prime target for large-scale agricultural development projects during the 1960s and 1970s. Cereals

²⁴ A. Kerr, *Farming Systems of the African Savanna. A Continent in Crisis*, International Development Research Centre, Ottawa 1995, pp. 44-45.

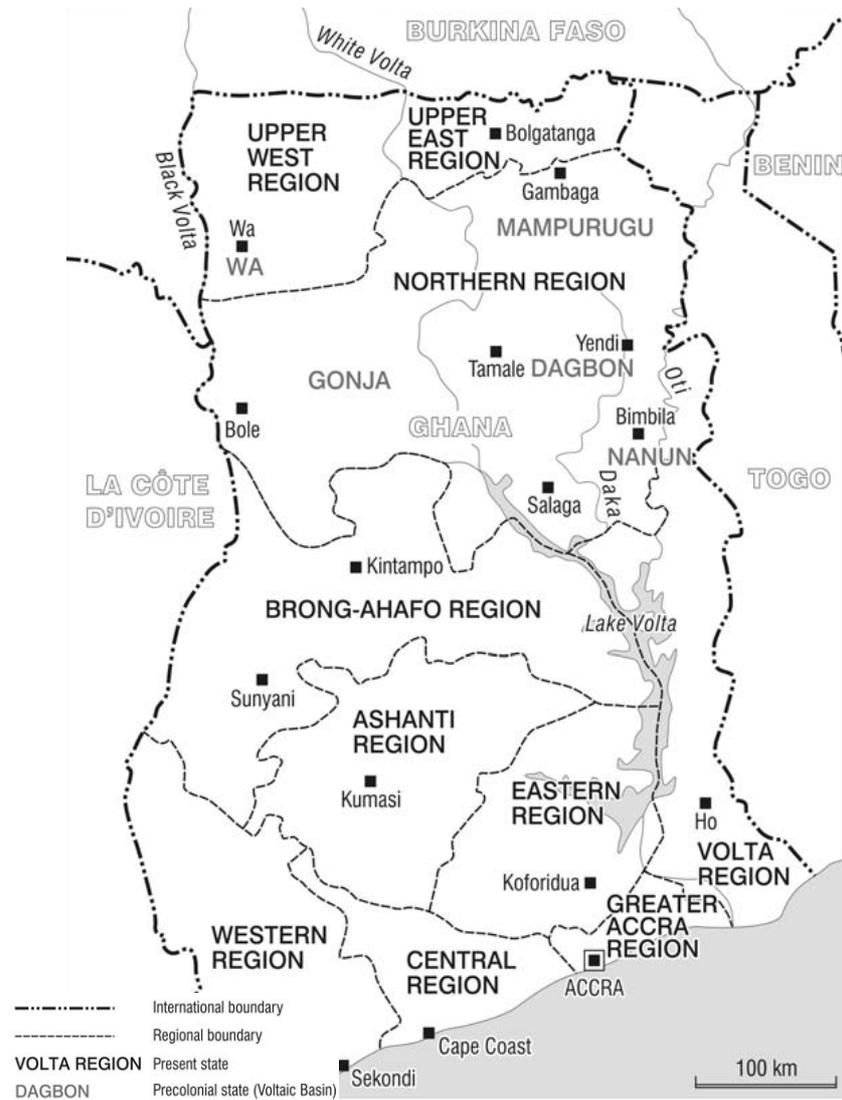
²⁵ Agyepong, Gyasi, Nabila, *Population, Land-Use and the Environment* cit., p. 252.

²⁶ Id., “Population, Land-Use and the Environment in a West African Savanna Ecosystem: An Approach to Sustainable Land-Use on Community Lands in Northern Ghana”, in *People and Their Planet: Searching for Balance*, B. Sundberg Baudot, W.R. Woomaw (eds), Macmillan Press, Houndmills 1999, p. 251.

²⁷ S. La Anyane, *Ghana Agriculture: Its Economic Development from Early Times to the Middle of the Twentieth Century*, Oxford University Press, London 1963, p. 63.

²⁸ R.J.H. Church, *West Africa. A Study of the Environment and of Man's Use of It*, 7th ed., Longman, London 1977.

Map 1. Ghana and the Voltaic Basin²⁹



²⁹ The term 'Voltaic Basin' refers to the region comprising the Black and White Volta Rivers. It comprises the northern part of contemporary Ghana, i.e., the Northern Region, the Upper East Region and the Upper West Region, as well as the southern part of Burkina Faso.

Table 1. Demographic conditions in Northern Ghana, 2000

Region	Population (total)	Area (km ²)	Pop. Density (pop./km ²)
Upper West	576,583	18,476	31,2
Upper East	920,089	8,842	104,1
Northern	1,820,806	70,384	25,9
Ghana (total)	18,912,079	235,500	79,3

Source: 2000 Population & Housing Census. Summary/Report of Final Results. Ghana Statistical Service, Accra 2002; <http://www.ghanadistricts.com/region>.

and root crops are mostly intercropped with groundnuts, cotton, cowpeas and Bambara beans. Local varieties of tubers, such as Frafra potato (*Plenranthus esculentus*) as well as sweet potatoes, cassava and cocoyams are mainly produced to supply the local market, while yams and cereals are exported to Southern Ghanaian markets.³⁰ Within this wide variety, Dietz et al. identify six staple “northern crops”: maize, sorghum, millet, rice, groundnuts and cotton.³¹

Demographically, Northern Ghana is divided between the sparsely populated Northern Region (the former Southern Province of the Northern Territories) and the relatively sparsely populated Upper West and densely populated Upper East regions (both part of the former Northern Province). All regions are ethnically heterogeneous and predominantly rural, although the effects of urbanization have been felt in Tamale, the region’s political, economic and transportation hub. During the early colonial period, British officials at first portrayed the region as a demographically stagnant, if not declining, backyard due to the effects of intensive late pre-colonial slave raids

³⁰ See further R. Blench, M. Dendo, *Working Paper: Agricultural Production and the Potential for Commodity Chain Expansion in the Three Northern Regions of Ghana in 2006*, revised version, Cambridge 7 January 2007, available on the web at: <http://www.rogerblench.info/Development/Ghana/FAO/Blench%20Working%20Paper%20Ghana%202006%20revised.pdf> (26.11.2011).

³¹ Dietz, Millar, Dittoh, Obeng, Ofori-Sarpong, *Climate and Livelihood Change in North East Ghana* cit., p. 151.

and warfare as well as the devastating effects of sleeping sickness and river blindness. However, by the 1930s, if not earlier, population increase was already marked, and colonial records refer to “overpopulation” as the main problem in the densely populated regions, due to soil erosion and land degradation (Table 1).

Population levels are difficult to determine accurately, but censuses during the early colonial period (beginning in 1901) indicated that the population of the Northern Territories was unevenly distributed. The majority of the population lived in the northernmost parts of the Protectorate, with relatively high population densities especially in the north-east. In some parts of the latter region, population densities reach more than 300 inhabitants per km. In contrast, the Southern Province had large stretches of very low population density.³² Differing densities produced different farming systems. In low-density areas such as Dagomba, farmers primarily cultivated bush farms located away from their compounds. The use of manure was rare, and farmers moved to farm new areas every few years. This became known pejoratively in colonial parlance as “shifting cultivation”. In the densely populated areas, bush farms were not as common, and farmers focused on compound farms near their homes (compounds) without moving as regularly between different fields.³³ Following Songsore, the agro-ecological regimes that emerged during the colonial period and continued into the postcolonial period were a) bush-farm dominant with supplementary compound farms and unlimited commons, b) bush-farm dominant with supplementary compound farms and limited fallows, and c) compound-farm dominant with supplementary

³² Public Records and Archives Administration Department, Accra [hereafter: PRAAD/A] 56/1/109, Census taking 1911 – Northern Territories. PRAAD/A ADM 56/1/241, Census taking 1921 – Northern Territories. Public Records and Archives Administration Department, Tamale [hereafter: PRAAD/T] NRG 8/3/43 Census Report – Northern Province. An assessment of the various censuses is provided in H. Weiss, *Between Accommodation and Revivalism: Muslims, the State and Society in Ghana from the Precolonial to the Postcolonial Era*, Finnish Oriental Society, Helsinki 2008, pp. 220-221.

³³ K.B. Dickson, *A Historical Geography of Ghana*, Cambridge University Press, Cambridge 1969, p. 313.

bush farms and privatization of economic trees in limited fallows.³⁴ While the last pattern is confined to densely populated areas in the Upper East and Upper West Region, the two other patterns dominate elsewhere.³⁵ Historically, cattle, sheep and goats could be found in many villages, but animal husbandry was impeded over large areas by the presence of the tsetse fly and trypanosomiasis.

General agricultural conditions remained more or less stable during the colonial period, apart from the attempt to introduce mixed farming, i.e., the use of bullock-drawn ploughs, and a few small-scale irrigation projects.³⁶ While some projects, such as schemes for the immunization of livestock and the elimination of rinderpest, were fairly successful, others, such as the attempt to introduce cassava, were not.³⁷ A distinctive feature of the area and one which haunted many farmers in the North, especially in the northeast where it was considered a structural problem, was the so-called “hungry season”, roughly from May to August. During this period, before the first crops were harvested (usually early millet), the intake of food by the local population could be as low as 60 to 70 per cent of normal requirements depending on the previous season’s rainfall.³⁸

Rainfall patterns and the cropping season

The single most decisive factor determining environmental conditions, as well as the agricultural cycle and output, is rainfall. Apart

³⁴ J. Songsore, “Population Growth and Ecological in Northern Ghana. Myths and Realities”, in *Research Review. New Series*, 12, 1-2, 1996, pp. 57-59.

³⁵ Blench, Dendo, *Working Paper* cit.

³⁶ J.B. Wills, “The General Pattern of Land Use”, in *Agriculture and Land Use in Ghana*, J.B. Wills (ed.), Oxford University Press for the Ghana Ministry of Food and Agriculture, London 1962, pp. 201-225. A. Shepherd, “Agrarian Change in Northern Ghana: Public Investment, Capitalist Farming and Famine”, in *Rural Development in Tropical Africa*, J. Heyer, P. Roberts, G. Williams (eds), Basingstoke and London, MacMillan, Houndsmills 1981, reprint 1986, pp. 170-171.

³⁷ Dickson, *Historical Geography* cit., pp. 173-175.

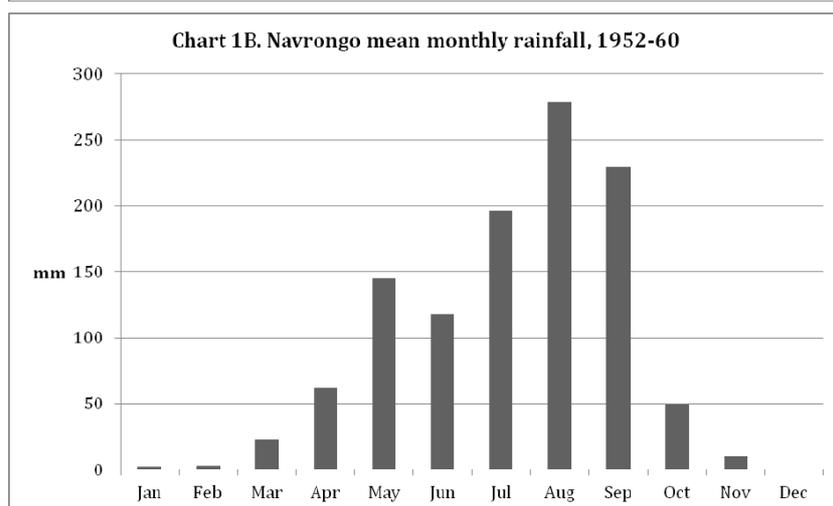
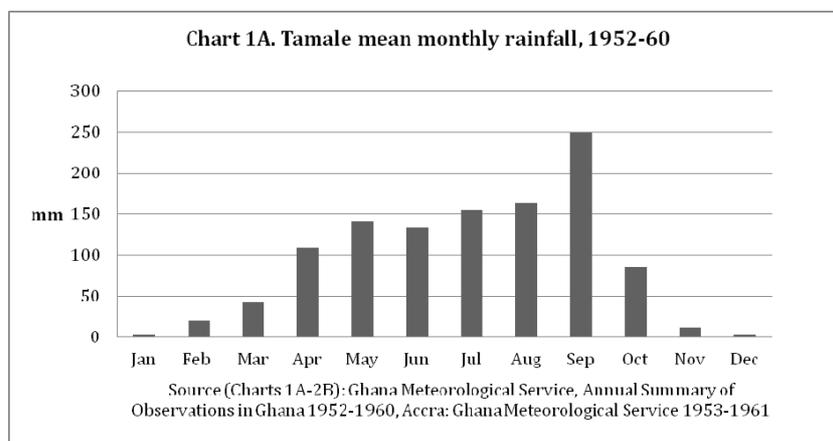
³⁸ Fao, *Land and Water Survey* cit., p. 7. For a critical discussion, see J. Destomes, “From Long-Term Patterns of Seasonal Hunger to Changing Experiments of Everyday Poverty: Northeastern Ghana c. 1930-2000”, in *Journal of African History*, 47, 2006, pp. 181-205.

from the coastal regions, West Africa at large is marked by varying lengths of the rainy and dry seasons. In the area from 8° to 12° N, i.e., roughly the Sudano-Guinea zone, the rainy season is expected to commence in April with a peak in August (or September at around 8°).³⁹ The mean annual rainfall for the Sudano-Guinea zone and the Guinea savannah ranges between 1200 and 1600 mm.⁴⁰ Further north, in the Sudan zone or the Sudan savannah, the average is between 800 and 1200 mm. But averages are poor indicators of farming patterns. From an agricultural and hydrological perspective, the annual and durational variations of the rains as well as the intensity and extensity of the rainfall are the decisive factors for the cropping season. As early as 1957, H.O. Walker noted the discrepancies between macro level observations indicating the seasonal north- and southward shift of the Intertropical Convergence Zone (ITCZ), on the one hand, and the meso- and microclimatic variations resulting in a high variability of the intensity, variability and duration of rainfall in the region, on the other. In Tamale, the political and economic centre of Northern Ghana, for example, in April, May and October most of the rainfall occurs at night and is usually unevenly distributed, while it is relatively well-distributed between June and September.⁴¹ These patterns have led many researchers to speak of a single rainy season in Northern Ghana, in contrast to a two-season model for Southern Ghana. However, as Barbé, Lebel and Tapsoba have underlined, earlier macro-level presentations about a gradual transition from a two-rainy-season regime in the South and a single rainy season regime in the North need

³⁹ S.E. Nicholson, B. Some, B. Kone, "An Analysis of Recent Rainfall Conditions in West Africa, Including the Rainy Seasons of the 1997 El Niño and the 1998 La Niña Years", in *Journal of Climate*, 13, 2000, p. 2629.

⁴⁰ According to D.F. Hayward, J.S. Oguntoyinbo, *The Climatology of West Africa*, Huchinson, London 1987, p. 124, the three administrative entities of Northern Ghana belong to two climatic regions. The southern part has a rainy season of 8 to 9 months and receives between 1000 to 1500 mm, the peak period being July to September. The rainy season in the northern part – i.e., the Upper East and the Upper West Regions – although shorter (6 to 7 months of rain) and showing a clear peak in August, yields more or less the same amount of precipitation (1000 to 1500 mm).

⁴¹ H.O. Walker, *Weather and Climate of Ghana*, Ghana Meteorological Departmental Note 5, Accra 1957, pp. 4-5, 8.



to be adjusted, as one can identify three rain maxima for the regions located between 7°-8° and 10° N, i.e., areas such as the Northern Region in Ghana.⁴² Our data for the 1950s supports this hypothesis, as this three-rain-maxima pattern is clearly recognizable in the rainfall statistics for Tamale, as indicated in Chart 1A. In contrast, the annual

⁴² L. Barbé, T. Lebel, D. Tapsoba, "Rainfall Variability in West Africa During the Years 1950-90", in *Journal of Climate*, 15, 2002, p. 195.

rainfall pattern in the northern parts of the Sudano-Guinea zone of Ghana, such as Navrongo in the Upper East Region, follows a two-rain-maxima pattern (Chart 1B).

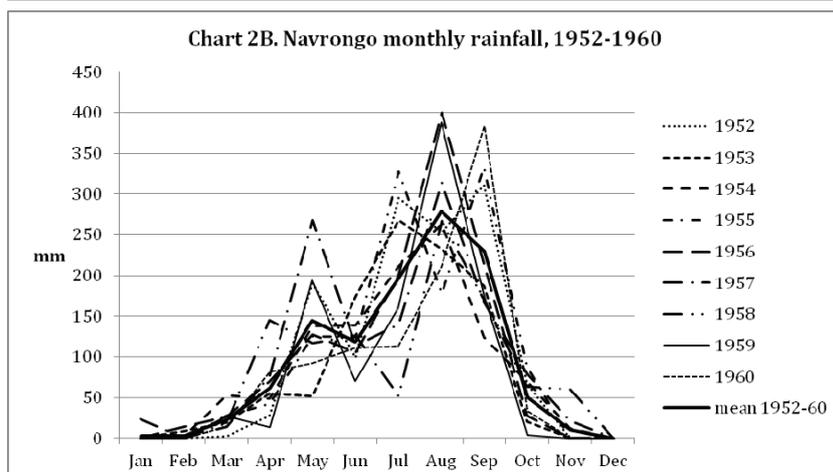
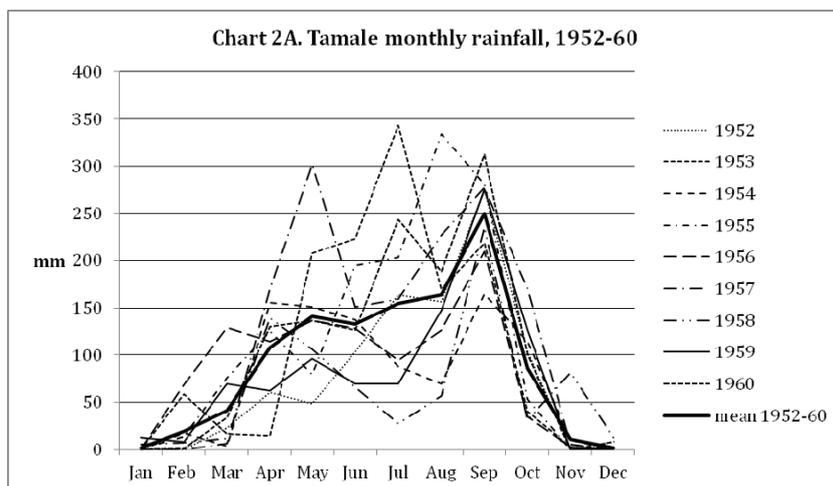
Complicating matters, however, is the fact that the two/three-rain-maxima pattern has no uniformity, as borne out by Charts 2A and 2B. Rather, there is significant inter-annual variation of rainfall at both Tamale and Navrongo, indicating that any notion of a “normal” rainy season in the Sudano-Guinea savannah is a statistical fallacy. Instead, as both tables indicate, there is a visible inter- and intra-annual variability in the occurrence and amounts of rainfall. The onset dynamics of the rainy season do not show any regular pattern, but rather an oscillating tendency.⁴³ Furthermore, the progress of the rainy season is unpredictable, especially at Tamale, where we see significant variations, such as a wet month with excessive precipitation one year and a prolonged dry spell during the same month one year earlier or later.⁴⁴ From an agro-climatic perspective, the most critical months are June and July, since the cessation of rains during the early months of the cropping season coupled with a drought can have grave consequences for harvest results, especially the early millet crop, which is the main crop that breaks the ‘hungry season’ (see below).⁴⁵ Unfortunately, the rainfall data available for this study does not enable us to further investigate the frequency of dry spells and its variation.⁴⁶

⁴³ See also O.F. Ati, C.J. Stigter, E.O. Oladipo, “A Comparison of Methods to Determine the Onset of the Growing Season in Northern Nigeria”, in *International Journal of Climatology*, 22, 2002, pp. 731-742.

⁴⁴ For a similar discussion on dry spells in Tamale, see S.G.K. Adiku, P.W.A. Dayananda, C.W. Rose, and G.N.N. Dowuona, “An Analysis of the Within-Season Rainfall Characteristics and Simulation of the Daily Rainfall in two Savanna Zones in Ghana”, in *Agricultural and Forest Meteorology*, 86, 1-2, 1997, pp. 51-62.

⁴⁵ See further M.V.K. Sivarkuma, *Drought Spells and Drought Frequencies in West Africa*, Research Bulletin N. 13, International Crops Research Institute for the Semi-Arid Tropics, Patancheru, Andhrar Pradesh 1991. M.V.K. Sivakuma, “Empirical Analysis of Dry Spells for Agricultural Applications in West Africa”, in *Journal of Climate*, 5, 5, 1992, pp. 532-539.

⁴⁶ A very sophisticated long-term analysis of dry spells is provided in M. Usman, C.J.C. Reason, “Dry Spell Frequencies and Their Variability over Southern Africa”, in *Climate Research*, 26, 2004, pp. 199-211.



West African long-term patterns of humid and dry periods

From our discussion it is clear that regional rainfall differences and microclimates make it difficult to correlate harvest success or failure with rainfall patterns for West Africa, or even Northern Ghana as a whole. Yet there are important studies that present broader patterns as a basis for policy actions. The irregular rainfall patterns of the 1950s

illustrated above must be analyzed within a long-term perspective of climate change in West Africa and Northern Ghana. The late colonial period, i.e., the 1950s, seems generally to correlate with a more humid period and favourable rainfall regimes throughout West Africa, although this was not the case in the Voltaic Basin, as indicated above. According to Nicholson et al., annual rainfall in the Sudano-Guinea zone was five percent greater during 1931-60 than during 1968-97. However, the data in their analysis for the 1950s clearly show an anomaly for the southern Voltaic Basin, i.e., low and erratic rainfall, as indicated in Charts 2A and 2B.⁴⁷ Further to the north, in the Sudan and Sahel zone, the 1950s stand out as an abnormally wet decade. Throughout West Africa, the following decades until the 1990s were marked by a general trend towards dryer years in West Africa, reaching a first nadir during the Sahel drought in the early 1970s and another during the drought in the early to mid-1980s, although no uniform pattern can be identified.⁴⁸ It has been observed that a warmer South Atlantic is associated with increased rainfall in the Guinea Coast region and decreased rainfall in the Sahel, while the El Niño Southern Oscillation (ENSO) phenomenon is claimed to have some effect on the Sahel climate but none on the coastal region.⁴⁹ Other studies have raised alarm about the rise of recorded

⁴⁷ Nicholson, Some, Kone, *Analysis of Recent Rainfall* cit., p. 2632 (figure 7) and p. 2635.

⁴⁸ J.S. Oguntoyinbo, "Climatic Variations and Food Crop Production in West Africa", in *GeoJournal*, 5, 2, 1981, pp. 139-149. S.E. Nicholson, "Sub-Saharan Rainfall 1981-84", in *Journal of Climate and Applied Meteorology*, 24, 1985, pp. 1388-1391. Id., "An Overview of African Rainfall Fluctuations of the Last Decade", in *Journal of Climate*, 6, 1993, pp. 1463-1466. For West Africa in general, see Le Barbé, Lebel, Tapsoba, *Rainfall Variability* cit. For Ghana, see P. Gyan-Boakye, J.W. Tumbulto, "Comparison of Rainfall and Runoff in the Humid South-Western and the Semiarid Northern Savannah Zone in Ghana", in *African Journal of Science and Technology, Science and Engineering Series*, 7, 1, 2006, pp. 64-72. O. Brown, A. Crawford, "Climate Change: A New Threat to Stability in West Africa? Evidence from Ghana and Burkina Faso", in *African Security Review*, 17, 3, 2008, pp. 39-57. K. Owusu, P. Waylen, "Trends in Spatio-Temporal Variability in Annual Rainfall in Ghana (1951-2000)", in *Weather*, 64, 5, 2009, pp. 115-120.

⁴⁹ S. Janicot, A. Harzallah, B. Fontaine, and V. Maron, "West African Mon-

temperatures (by 1°C) and the sharp decrease of rainfall and runoff (by approx. 20 to 30 percent) during the same period.⁵⁰

Broad regional data exists for earlier periods as well. Some researchers, such as Nicholson, Brooks and Webb, have discussed the data for climatic change before 1900, highlighting the oscillations between drier and wetter periods in the history of the region.⁵¹ However, meteorological data for historical climatological reconstructions are available for West Africa only from the beginning of the 20th century. As in the period between 1950 and the 1990s, the Sudano-Guinea region as a whole was affected by great annual fluctuations in rainfall patterns during the first half of the twentieth century. Following Nicholson's data, the period from 1900 to about 1920 experienced huge annual variations, whereas the next two decades seem to have been generally "normal".⁵² The 1940s, again, were

soon Dynamics and Eastern Equatorial Atlantic and Pacific SST Anomalies (1970-88)", in *Journal of Climate*, 11, 8, 1998, pp. 1874-1882. G. Gu, R.F. Adler, "Seasonal Evolution and Variability Associated with the West African Monsoon System", in *Journal of Climate*, 17, 17, 2004, pp. 3364-3377. M. Joly, A. Voldoire, "Influence of ENSO on the West African Monsoon: Temporal Aspects and Atmospheric Processes", in *Journal of Climate*, 22, 12, 2009, pp. 3193-3210.

⁵⁰ F.A. Armah, J.O. Odoi, G.T. Yengoh, S. Obiri, D.O. Yawson and E.K.A. Afrifa, "Food Security and Climate Change in Drought-Sensitive Savanna Zones of Ghana", in *Mitigation and Adaptation Strategies for Global Change*, 16, 2011, p. 295.

⁵¹ S. Nicholson, "Climatic Variations in the Sahel and other African Regions During the Past Five Centuries", in *Journal of Arid Environments*, 1, 1978, pp. 3-24. G.E. Brooks, *Western Africa to c1860 AD: A Provisional Historical Schema Based on Climate Periods*, African Studies Program, Bloomington, Indiana 1985. J. Webb, *Desert Frontier: Ecological and Economic Change Along the Western Sahel, 1600-1850*, University of Wisconsin Press, Madison 1995. For an overview, see J.C. McCann, "Climate and Causation in African History", in *International Journal of African Historical Studies*, 32, 2-3, 1999, pp. 261-279.

⁵² "Normal" in this case means that there were few variations from the statistical mean annual rainfall. Nicholson's outline for the Sahel and Sudan zones is based on her discussion of rainfall changes and the variation of Lake Chad. According to her, recent climate history of the Sahel and Sudan zone suggests for the twentieth century a period of declining rainfall between c. 1895 to 1913, culminating in a severe drought in the 1910s, above-average rainfall in the mid-1900s, but a dryer climate since the 1960s and severe average rainfall deficit in the 1970s and 1980s (S.

drier, whereas annual rainfall during the 1950s was much higher than the statistical mean. Rainfall patterns also could be highly localized. For West Africa as a whole, Nicholson observes for instance that the neighboring Sudano-Guinea and Sahel zones could have opposite wet/dry patterns during the same decade.⁵³ However, as noted above, the decadal rainfall pattern in Northern Ghana does to some extent differ from Nicholson's projection. It is therefore necessary to examine narrower regional patterns.

A century of dry and wet periods in Northern Ghana

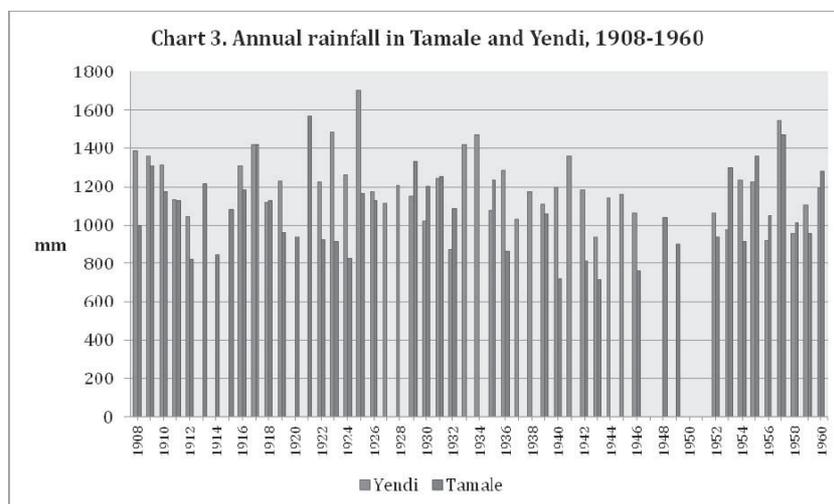
For Northern Ghana, Ghanaian climatologist Ofori-Sarpong carried out a survey of all extant rainfall data for the period 1900-1993. The average yearly rainfall during this period was slightly higher than 1200 mm. However, there were substantial fluctuations within the period. Using a five-year moving average, Ofori-Sarpong concluded that 1900-15 was a bad period, with droughts in 1904 and 1912. The situation improved between 1915 and 1917, with an all-time annual peak of close to 2000 mm in 1917. This was followed by drought conditions between 1918 and 1920, an average period between 1920 and 1935, and another dry period between 1935 and 1945. The period 1945 to 1975 was very good on the whole, with the exception of 1957-1960 (1960 being extremely bad).⁵⁴ Ofori-Sarpong's data corresponds relatively well with Nicholson's, with the exceptions of 1935-40 ("normal" according to Nicholson but dry according to Ofori-Sarpong) and 1957-60 (very wet according to Nicholson but extremely dry according to Ofori-Sarpong).⁵⁵

Nicholson, "Saharan Climates in Historic Times", in *Sahara: Ecological Change and Early Economic History*, J.A. Allan (ed.), Menas Press, London 1981, pp. 35-59).

⁵³ Nicholson, *Saharan Climates* cit., Figure 9.

⁵⁴ Dietz, Millar, Dittoh, Obeng and Ofori-Sarpong, *Climate and Livelihood Change* cit., p. 155.

⁵⁵ However, Nicholson's data for the 1950s clearly indicate that rainfall was negative from the long-term mean throughout northern Ghana, see S.E. Nicholson, "Climatic and Environmental Change in Africa During the Last Two Centuries", in *Climate Research*, 17, 2001, p. 129 (Fig. 6).



Ofori-Sarpong’s presentation provides a good outline of the general trend of rainfall in northern Ghana. However, a closer examination of the data for Tamale and Yendi further highlights the complex micro-climatic variations in the region (see Chart 3). The adverse rainfall conditions during the two first decades of the century are notable, although the data for Tamale at least seems to indicate that the 1912 drought year was followed by another bad year in 1914.⁵⁶ Rainfall data from Yendi and Tamale generally correlate well, but with some remarkable exceptions during the early 1920s and the 1940s, when lower annual amounts of rain were consistently reported from Tamale. This data seems to contradict rainfall charts where Yendi appears among the places receiving on average above 1200 mm annually while Tamale, which belongs to a drier section of the country, is indicated as receiving less than 1200 but more than 1000 mm rain per annum. On the other hand, in other categories, such as the start of the rainy season, its length, the number of days and the peak of the rainy season, the two areas fall within the same group.⁵⁷

⁵⁶ See further Weiss, *Crop Failures* cit., pp. 24-25.

⁵⁷ See figures in Ofori-Sarpong, *The 1981-1983 Drought* cit., pp. 108-127.

While the data for Yendi and Tamale in Chart 3 corresponds with Ofori-Sarpong's presentation of wet and dry years and decades until the 1940s, the claim that the period from 1945 until 1957 was a "good" period cannot be supported from the available data. As Chart 3 indicates, the second half of the 1940s was a problematic period, at least in Yendi. During the following decade the region seems to have witnessed a "bad" rainy season every other year, culminating in the drought of 1958. As will be demonstrated later in this article, annual harvest reports from the 1940s and 1950s contain further evidence of adverse or favourable weather conditions and their impact on the early and late crops. In general, these reports highlight the great variation both in time and space of rainfall distribution in a given year. Thus, while Chart 3 indicates that 1946 was a "dry" year, the agricultural reports state that Dagomba (Tamale and Yendi) witnessed poor yam and early millet crops due to the drought but average late crops as the rains returned in August. Totally different conditions prevailed in Southern Mamprusi, which reported very good crops for years. On the other hand, Chart 3 notes relatively dry conditions in Tamale in 1949, but the agricultural report claims that it was one of the best seasons for many years. As we shall see, colonial authorities recognized the high variation and fluctuations in the daily, monthly and annual distribution rainfall, the risk of adverse agricultural conditions, and the likelihood that famine could affect large sections of the region. However, they were slow to grasp this reality. A turning point in their awareness occurred only in the early 1930s. By the 1940s, several programmes were implemented to mitigate the effects of droughts.

Historical context

The slowness of the colonial administration to grasp the complexity of climate and its effect on local societies was largely due to the peripheral status of the region. Britain annexed present-day Northern Ghana as the Protectorate of the Northern Territories of the Gold Coast in September 1901.⁵⁸ The British had long controlled the coastal areas,

⁵⁸ The same Order-in-Council also established the Gold Coast Colony south

but the expansion into Asante (Ashanti) and the Northern Territories reflected the nineteenth-century scramble for West Africa against the French and Germans. Moving north from the coast, British forces occupied Kumasi in January 1896 and the Asante polity was effectively brought under colonial domination.⁵⁹ Thereafter, in November 1896 Major H.P. Northcott led British forces from Asante farther north to combat the advances of the Germans and French as well as the military campaigns of the Juula leader Samori Touré and the Zabarima warrior Babatu.⁶⁰ In 1897, the Governor appointed Northcott ‘Commissioner and Commandant of the Northern Territories of the Gold Coast’. Between June, 1898 and November, 1899, Northcott defined the Protectorate’s boundaries in separate agreements with the French and Germans. These boundaries formed the territorial basis of the Protectorate, whose formal existence began when the Order-in-Council came into effect in January, 1902.

At this time, the North was divided politically into states and “stateless” societies. The main states or “kingdoms” had emerged in the southern zone, including Dagomba, Gonja and Mamprusi, and they are ruled by leaders recognizable to the British as “chiefs”.⁶¹ Stateless societies dominated the northern zone, without centralized leaders or bureaucratic structures. Northcott took states as his model, and he adopted a model of ruling through chiefs. Appointing them posed major challenges in the stateless areas where chiefs as such did not exist. Many of these societies also put up strong resistance to British rule, so that Northcott first had to “pacify” them militarily and then create chiefs through which to rule. The task of appointing traditional rulers was relatively easier in the southern part of the Protectorate. Even here, however, individuals and factions competed for chiefly power. Once

of the river Pra and the Ashanti Colony to its north. Together these territories formed the colony of the Gold Coast.

⁵⁹ R. Gocking, *The History of Ghana*, Greenwood Press, Westport 2005, p. 45.

⁶⁰ P.A. Ladouceur, *Chiefs and Politicians: The Politics of Regionalism in Northern Ghana*, Longman, London 1979, p. 40.

⁶¹ See further P. Skalnik, “Early States in the Voltaic Basin”, in *The Early State*, H.J.M. Claessen, P. Skalnik (eds), Mouton Publishers, The Hague/Paris/New York 1978, pp. 469-494.

appointed, the chiefs selected by the colonial administration fought to manipulate the system to their own benefit. In other words, the colonial chiefs were not “traditional” in the sense of possessing a deep historical or cultural mandate to act as trustees of their communities.⁶²

Resistance and uncertain power structures meant that the Northern Territories were placed under military rule until 1908, when the political structure system shifted to a civilian system consisting of a Chief Commissioner, who oversaw a hierarchical system of Regional and District Commissioners. Within this structure, the chiefs had little autonomous power. Instead, the administrative system that prevailed until the early 1930s has been characterized as “direct rule”, under which the chiefs acted as mere instruments for implementing orders and had no official or inherent political authority.⁶³ The chiefs could manipulate the system to a certain extent, but colonial officials reserved the power to remove them if they refused to co-operate with colonial policies. In the 1920s, Sir Frederick (Lord) Lugard developed a new system in Northern Nigeria called Indirect Rule, in which the colonial state absorbed chiefs into government as salaried employees, and granted them local powers over administration, justice and tax collection. In theory the chiefs were to rule according to customary law. During the 1920s and early 1930s, the Gold Coast administration rejected indirect rule for the Colony and Ashanti, but decided that it could work in the Northern Territories. Beginning in 1932, the colonial state invested the chiefs with formal local powers, and gave them institutional support in the form of Native Authorities.⁶⁴ This system remained in force until the late 1940s.

⁶² On the ‘invention of chiefs’ in northern Ghana during the colonial period as well as the mutual manipulation of the colonisers and local chiefs, see further J. Grischow, “Corruptions of Development in the Countryside of the Northern Territories of the Gold Coast”, in *Journal of Peasant Studies*, 26, 1, 1998, pp. 139-158. C. Lentz, “Colonial Ethnography and Political Reform: The Works of A.C. Duncan-Johnstone, R.S. Rattray, J. Eyre-Smith and J. Guinness on Northern Ghana”, in *Ghana Studies*, 2, 1999, pp. 119-169. S. Hawkins, *Writing and Colonialism in Northern Ghana*, University of Toronto Press, Toronto 2002.

⁶³ Ladouceur, *Chiefs and Politicians* cit., p. 41.

⁶⁴ D.E. Apter, *The Gold Coast in Transition*, Princeton University Press, Princ-

British officials knew little about the North's resources before the 1890s, apart from its role as a transit zone for caravans from the West African interior. Influenced by the reports of George Ekem Ferguson,⁶⁵ Northcott became entranced by the caravan trade and envisioned capturing it for the colonial state by inserting British goods into its main channels. He also imposed a caravan tax to raise immediate revenues for the Protectorate. Between 1901 and 1907, Northcott's successors attempted to diversify the north's development, promoting gold mining, cotton production and cattle rearing, and opening Government stores in Gambaga and Salaga to build an appetite among the population for British goods.⁶⁶ None of these plans succeeded and the caravan tax remained the only stable source of revenue. However, in 1907 the Colonial Office dropped the caravan tax in order to create a free trade zone and attract more caravans to supply the growing urban populations of the South.⁶⁷ This meant that the Northern Territories had virtually no independent revenues from which to meet its costs.

To reverse this situation, between 1908 and 1912 several Chief Commissioners tried to promote cash crop production for Ashanti, the Colony and even the world market. To this end, in 1908 Chief Commissioner (CCNT) A.E.G. Watherston moved the capital south from Gambaga to Tamale where it would be closer to the markets of

eton 1955, pp. 123, 133. The formal framework for Indirect Rule in the Northern Territories consisted of three ordinances approved in 1932: the Native Authority Ordinance, the Native Tribunals Ordinance and the Native Treasuries Ordinance. See further M. Staniland, *The Lions of Dagbon: Political Change in Northern Ghana*, Cambridge University Press, Cambridge 1975, p. 86-98. Ladouceur, *Chiefs and Politicians* cit., pp. 55-57.

⁶⁵ Ferguson was an African (Fante) official from the Gold Coast Colony who travelled to the north in 1892 and 1894 and observed an important caravan trade centred on Salaga, in which caravans from the Western Sudan exchanged ivory, horses and cattle for salt and kola nuts. See K. Arhin (ed.), *The Papers of George Ekem Ferguson, A Fanti Official of the Government of the Gold Coast, 1890-1897*, Afrika-Studiecentrum, Leiden 1974, pp. 67-70.

⁶⁶ For details, see the *Annual Reports on the Northern Territories* for 1901-7.

⁶⁷ Gold Coast, *Northern Territories Annual Report for 1905*, Government Printer, Accra, 1906, p. 4.

Ashanti and the Colony. Watherston also developed a new road policy and port that established Tamale as the transit hub for the north.⁶⁸ After laying this foundation, Watherston attempted to develop cash crops, salt trading and livestock production, and he promoted the north's resources in a series of articles in prominent British journals.⁶⁹ This strategy attracted some interest, particularly from the British Cotton Growing Association (BCGA).⁷⁰ However, Watherston's successor Arthur Festing did not share his optimism, nor did Governors James Thorburn (1910-12) or Hugh Clifford (1912-19).⁷¹ The Colony and Ashanti were developing rapidly based on cocoa production and min-

⁶⁸ Gold Coast, *Northern Territories Annual Report for 1908*, Government Printer, Accra, 1909, p. 9. A.E.G. Watherston, "The Northern Territories of the Gold Coast", in *Journal of the Royal African Society*, VII, 28, 1908, pp. 355-70.

⁶⁹ Cash crops included cotton, hibiscus, rubber, shea butter and tobacco. Gold Coast, *Northern Territories Annual Report for 1908*, Government Printer, Accra, 1909, pp. 8-9. Watherston promoted these and other crops in journals, including the *Incorporated Chamber of Commerce of Liverpool Monthly Magazine* and the *Journal of the Royal African Society* (B. Chalfin, *Shea Butter Republic: State Power, Global Markets, and the Making of an Indigenous Commodity*, Routledge, New York 2004, p. 104).

⁷⁰ Gold Coast, *Northern Territories Annual Report for 1910*, Government Printer, Accra 1911, pp. 365-66. K.O. Dike-Nworah, "The West African Operations of the British Cotton Growing Association, 1904-1914", in *African Historical Studies*, 4, 2, 1971, pp. 315-331. M. Johnson, "Cotton Imperialism in West Africa", in *African Affairs*, 73, 291, 1974, pp. 178-187. Gold Coast, *Northern Territories Annual Report for 1908*, Government Printer, Accra, 1909, p. 8.

⁷¹ For their comments, see Gold Coast, *Northern Territories Annual Report for 1910*, HMSO, London 1911, p. 6. D. Kimble, *A Political History Of Ghana: The Rise Of Gold Coast Nationalism, 1850-1928*, Oxford University Press, London 1965, p. 534. PRAAD/A ADM 56/1/464, Letter by Gov. Clifford to Lewis Harcourt, 14.7.1913. See also N.J.K. Brukum, "Studied Neglect or Lack of Resources? The Socio-Economic Underdevelopment of Northern Ghana Under British Colonial Rule", in *Transaction of the Historical Society of Ghana*, New Series 2, 1998, pp. 117-131. Sir H. Clifford, Speech to the Legislative Council, 13 October 1913, quoted in G.E. Metcalfe, *Great Britain and Ghana: Documents of Ghana History, 1807-1957*, Thomas Nelson and Sons, London 1964, pp. 546-547. See also Sir H. Clifford, "Recent Developments on the Gold Coast", in *Journal of the Royal African Society*, 18, 72, 1919, pp. 246, 251-252, and "Some Facts Concerning the Gold Coast", in *Journal of the Royal African Society*, 14, 53, 1914, pp. 20-21. Id., "The Gold Coast", in *Blackwoods*, January 1918, p. 55.

ing, and the remote Northern Territories would have to wait for their turn until better transport networks could make exports profitable. This is not to say that the North did not contribute to the colonial economy, for by 1919 it had taken on an important role as a labour pool supplying migrant workers to the mines and the cocoa farms.⁷²

In 1919, Governor Sir F.G. Guggisberg reversed Clifford's stance and promoted the North as a potential cash crop region. "The whole future of the Gold Coast", he wrote in 1920, "is bound up with the development of the groundnut and shea butter industries in the Northern Territories".⁷³ To make this a reality, Guggisberg would build a railroad between Kumasi and Tamale, whose trains would be "heavily loaded with groundnuts, shea-butter, corn and cattle steaming South across the Volta".⁷⁴ As in the past, Guggisberg's plans failed because the North's resources could not be developed quickly or effectively enough to make a northern railway profitable. But Guggisberg's time in office nonetheless witnessed an important turning point in the development of the Protectorate. Although he failed to build a railway, he did improve the road network to the north, focused on Tamale as the administrative and economic hub. As a result, motor traffic began to reach the Northern Territories in the early 1920s. This development coincided with declining subsistence production in the south in favour of cash crops, particularly cocoa, which resulted in higher demand for foodstuffs. Increased cocoa production combined with mining caused a growing population in the Colony and Ashanti to depend on the market for their subsistence. Motor transportation in the north made foodstuff exports profitable, and farmers responded to private buyers from Kumasi

⁷² I. Sutton, "Colonial Agricultural Policy: The Non-Development of the Northern Territories of the Gold Coast", in *The International Journal of African Historical Studies*, 22, 4, 1989, pp. 637-669.

⁷³ *Report on the Northern Territories of the Gold Coast, 1920*, HMSO, London 1921, p. 6.

⁷⁴ P. Konings, *The State and Rural Class Formation in Ghana: A Comparative Analysis*, ICPI Limited, London 1986, p. 164. For an excellent analysis of colonial investigations into shea production during Guggisberg's tenure, see Chalfin, *Shea Butter Republic* cit., pp. 103-22.

and Accra, who would travel north to buy as much as they could get. In addition, there was an increasing demand for food for the European and African salaried employees of the colonial administration and its various departments in Tamale.⁷⁵ Hence we find that the production of foodstuffs for export, mainly yams, maize and rice, started during the 1920s in the Southern Province.⁷⁶

These developments prompted farmers in the Southern Province to cultivate significantly more land in response to increased demand, especially because the advent of motor transport made selling foodstuffs profitable. They were producing above subsistence.⁷⁷ In 1923-4, the Chief Commissioner reported that farmers in the Southern Province were increasing their acreages and that foodstuffs were finding a ready market, as northern producers sold to “the numerous private motor-lorry owners now using the main road”.⁷⁸ The following year motor traffic doubled as thousands of yams as well as sheep, goats, and fowls made their way south to Kumasi.⁷⁹

Despite the growth of markets, most northern farmers still did not achieve consistent production levels at or above subsistence. Indeed, between 1901 and the 1930s colonial reports regularly commented on poor harvests and food shortages in the region, caused by a number of factors. Low annual rainfall levels appeared to affect harvests in 1912, 1914, 1920 and 1922.⁸⁰ However, there was no simple correlation between lower-than-average yearly rainfall and poor harvests. Even in

⁷⁵ PRAAD/A ADM 56/1/506, Annual Report (AR) Western Dagomba District 1926-27. PRAAD/T NRG 8/3/8 Annual Report (AR) Northern Territories (NTs) 1926-27, para 34.

⁷⁶ PRAAD/A ADM 56/1/505, AR NTs 1923-24, para 17. PRAAD/T NRG 8/3/53, AR NTs 1935-36, para 24.

⁷⁷ PRAAD/A ADM 56/1/500, AR NTs 1922-3, para 19.

⁷⁸ PRAAD/A ADM 56/1/505, AR NTs 1923-24, para 7.

⁷⁹ Gold Coast, *Annual Report on the Northern Territories* 1925-6, Government Printer, Accra, 1926, p. 6.

⁸⁰ Between 1901 and 1907, the only meteorological station was Gambaga. In 1908, a station was opened in the new administrative capital, Tamale, then, in 1922, additional stations were opened in Yendi, Krachi, Salaga, Wa and Zuarungu. See the *Annual Reports of the Northern Territories of the Gold Coast* between 1901 and 1925-6.

a good year, if the rains failed at critical planting times the crops could fail, as happened in 1910 and 1926 throughout the Protectorate.⁸¹ Heavy rains could also damage crops, as occurred in 1913 and 1921 around Tamale, and in 1915 and 1920 in the Northwestern Province.⁸² Insect pests also posed risks. In 1915, for instance, grasshoppers damaged the first millet crop in the North-West Province, and in 1921 caterpillars destroyed early millet in Bawku, Bari, Zouaragu and Kologu.⁸³ Human disease could play a role as well. In 1907 and 1908, cerebro-spinal meningitis killed 20,000 people, and the reduction in the labour supply combined with poor rainfall to produce famine conditions in both years.⁸⁴ A decade later, the global influenza epidemic affected harvests because it reduced the labour needed to take in the crops.⁸⁵ Some colonial officials also believed that labour migrancy to the South also affected farm labour in the North, despite the assumption that the workers went south temporarily between planting and harvesting.⁸⁶ Drought in other colonies could also affect food security in the Northern Territories. This happened in the North-West Province in 1914, when Mossi traders from French arrived to buy food in

⁸¹ Gold Coast, *Annual Report on the Northern Territories, 1910*, Government Printer, Accra, 1911, p. 8. Id., *Annual Report on the Northern Territories, 1925-6* cit., pp. 6-7.

⁸² Id., *Annual Report on the Northern Territories, 1913*, Government Printer, Accra, 1914, p. 18. Id., *Annual Report on the Northern Territories, 1921*, Government Printer, Accra, 1922, p. 5. Weiss, *Crop Failures* cit., p. 16.

⁸³ Gold Coast, *Annual Report on the Northern Territories, 1915*, Government Printer, Accra, 1916, p. 5. Id., *Annual Report on the Northern Territories, 1921* cit., p. 5.

⁸⁴ K.D. Patterson, "Cerebrospinal Meningitis in West Africa", in *Cerebrospinal Meningitis in West Africa and Sudan in the Twentieth Century*, K.D. Patterson, G.W. Hartwig (eds), Crossroads Press, Los Angeles 1984, pp. 14-15. According to Patterson, CSM was endemic in Hausaland but had not spread westward before 1905. Northern Nigeria witnessed a devastating outbreak of CSM in 1905. See also H. Weiss, *Babban Yunwa. Hunger und Gesellschaft in Nord-Nigeria und den Nachbarregionen in der frühen Kolonialzeit*, Suomen Historiallinen Seura, Helsinki 1997, pp. 221-230, and J. Grischow, "Globalisation, Development and Disease in Colonial Northern Ghana, 1901-1960", in *Working Papers on Ghana: Historical and Contemporary Studies*, 9, 2006.

⁸⁵ PRAAD ADM 56/1/489, AR NTs 1918, para 6.

⁸⁶ PRAAD ADM 56/1/470, AR Southern Province [SP] 1914.

the wake of famine conditions at home. The influx reduced an already small supply of food, and triggered price increases of over 50% in a few weeks.⁸⁷ Finally, the growth of cash cropping in South Dagomba during the 1920s threatened food security because demand far exceeded supply, leading to an increase in food prices, especially in larger towns like Tamale and Salaga.⁸⁸

Outlining colonial famine relief, early 1930s

Despite the periodic food insecurity noted above, the colonial government did not respond with direct famine prevention policies until the early 1930s. By this time the Northern administration had become concerned with recurrent food crises that seemed to affect the northeastern part of the Protectorate, particularly the densely populated Zuarungu District. However, the first attempt to alleviate the situation ended in a fiasco. Alarmed by reports of inadequate food supplies in the Northeast, the government started a famine-relief operation in 1930-31 but realized that sufficient goods could not be transferred to the north and – more importantly – that the food situation was not as critical as had been anticipated. As a direct consequence, the colonial administration recognized the need to closely monitor the food supplies in the districts. However, the first assessments were contradictory. After his tour in the North in April 1931, Medical Officer Dr. W.E. McCulloch claimed that no food shortage existed in the Navrongo District and that the local diet was from a nutritional perspective sufficient, and the Annual Medical Report only recognized “semi-starvation” to be “transitory”.⁸⁹ Later investi-

⁸⁷ Gold Coast, *Annual Report on the Northern Territories, 1914* cit., pp. 8-11. Id., *Annual Report on the Northern Territories, 1915* cit., p. 5.

⁸⁸ PRAAD/A ADM 56/1/500, AR SP 1922-23, p. 12. PRAAD/A ADM 56/1/501, AR SP 1923-24, p. 12, AR SP 1924-25, p. 13. Gold Coast, *Annual Report on the Northern Territories, 1925-6* cit., p. 6.

⁸⁹ W.E. McCulloch to Chief Commissioner of the Northern Province, 11.5.1931, quoted in Destombes, *From Long-Term Patterns* cit., p. 190. Gold Coast, *Annual Report of the Medical Department, 1931-32*, Government Printer, Accra, 1933, p. 33.

gations on the nutritional status of the population in the Northeast presented a totally different state of affairs. The agricultural surveys of Charles Lynn during the 1930s had already noted the critical conditions prevailing in the more densely populated localities (see below), and this was confirmed by Dr. F.M. Purcell's nutritional and anthropometric survey of 1939. Purcell's investigation highlighted the fact that poor diet was not only seasonal but also chronic, and deficient intakes were observable both pre- and post-harvest.⁹⁰

However, the colonial administration and government were slow to react on Purcell's report. Instead of planning structural reforms to solve the problem of the "hungry season", two programs were developed during the 1930s: famine relief policies and mixed farming. When the government decided to implement indirect rule in the North, the administration considered incorporating famine relief policies into the new Native Administration Ordinance.⁹¹ The draft policies, which empowered chiefs to issue famine prevention orders subject to the direction of the colonial District Administration, included food-for-work programs, forced migration to food-surplus areas, prohibition of food exports outside famine areas, and support for food-crop cultivation.⁹² Significantly, these orders only provided for famine relief, not prevention, and in any case they never went into effect because they were not included in the final version of the Native Administration Ordinance. It was thus left to officials on the ground to address their concerns over food scarcity. In rare cases, the Northern administration offered food-for-work programs and direct relief. This happened in 1934 in the Builsa area after locusts entirely destroyed the early crops and severely damaged the late crops in five villages.⁹³ The government provided funds (£600) as a lump-sum

⁹⁰ Destombes, *From Long-Term Patterns* cit., pp. 192-194.

⁹¹ PRAAD/T NRG 8/2/4, Memo on the proposed NT Native Administration Ordinance, p. 4.

⁹² PRAAD/T NRG 8/2/4, Outlines for the NT Native Administration Ordinance, section 83.1.a-d.

⁹³ On locust invasions in Northern Ghana during the late 1920s and the 1930s, see H. Weiss, "Locust Invasions in Colonial Northern Ghana", in *WOPAG – Working Papers on Ghana: Historical and Contemporary Studies*, 3, 2004.

for direct food relief for the weaker people and £516 to able-bodied workers for road construction in the affected area, which was used to buy grain from surplus areas. According to the Assistant District Commissioner, about 1000 persons had received either direct or indirect famine relief during the farming season.⁹⁴ But this sort of direct government action was the exception rather than the norm.⁹⁵

Much more common were attempts to increase production, either through communal farming or mixed farming. The aim of communal farming was to produce surpluses on communally farmed land, under the direction of the chiefs, which could be stored as food reserves. District Commissioners worked with chiefs to require every headman to send workers to the farm, which was cleared of bush and grass, and then put under cultivation. The farms might include drought-resistant crops such as cassava and yams, which would not be damaged by locust swarms. Colonial officials also promoted the communal cultivation of rice.⁹⁶ While some communal farms were developed, they never functioned effectively as famine prevention tools. There had been no tradition of communal farming during the pre-colonial period, and some of the chiefs used the farms to accumulate personal wealth by selling the produce and pocketing the cash. As a consequence there was money in the chiefs' hands but no food in the reserves.⁹⁷

Mixed farming focused on expanding individual peasant farms by combining crop and livestock production to increase productivity through manure and bullock ploughs.⁹⁸ Agriculturalist Charles Lynn developed the system in the Northern Territories out of a process of survey

⁹⁴ PRAAD/T NRG 8/3/49, AR NT 1934-35, para 130. The currency (£) was the British West African pound. It was equal to the pound sterling and was similarly divided into 20 shillings, each of 12 pence.

⁹⁵ See for example the discussion of Zuarungu in PRAAD/T NRG 8/3/91, AR Agricultural Dept Northern Mamprusi District 1939/40.

⁹⁶ PRAAD/T NRG 8/3/53, AR NT 1935-36, para 212.

⁹⁷ See, for example, PRAAD/T NRG 2/3/1. W. Miller, *Report on Native Administration of Dagomba Sub-District*, Tamale 27.9.1933.

⁹⁸ I. Scoones, E. Wolmer (eds), *Pathways of Change: Crops, Livestock and Livelihoods in Africa. Lessons from Ethiopia, Mali and Zimbabwe*, Institute of Development Studies, Sussex, UK 2000, pp. 3-4. J. Sumberg, "Mixed Farming in Africa: the Search for Order, the Search for Sustainability", in *Land Use Policy*, 15, 4, 1998, p. 298.

and experimentation between 1932 and 1937, focusing initially on the northeast.⁹⁹ Lynn was sent to North Mamprusi for the first time in 1930 on locust control duties.¹⁰⁰ In the same year the colonial administration mounted its disastrous famine relief program in the far north. Although the effort proved costly and ineffective, it gave an impetus to field enquiries designed to gather reliable data on food crises in the area.¹⁰¹ Lynn thus returned to Zuarungu in 1932 to conduct a systematic agricultural survey and make recommendations for improvements. During his survey Lynn found that the average farmer cultivated between two and four acres on a fixed plot of land using hoe technology. Most farmers applied some manure to maintain soil fertility, but soil erosion was evident and peasant production was barely above subsistence. Farmers reported to Lynn that they experienced food shortages in two out of every five years. Adding to the challenge was the fact that, while Lynn conducted his survey between 1932 and 1937, the region entered into a dry period (see Table 3). In spite of the adverse weather conditions, annual harvests were still usually reported to have been 'sufficient' or 'average' with annual local and regional exceptions. Food shortage was more or less chronic in the northeastern part of the territories during the 1930s.¹⁰² Locust invasions were causing havoc during the 1930s, especially in 1933 (Lawra District) and 1936-1937 (Western Dagomba and Central Gonja);¹⁰³ during the latter crisis the Native Authorities even issued a ban on exports of food crops.¹⁰⁴ This trend would have given Lynn an additional impetus to suggest changes to the existing system. In the

⁹⁹ C. Lynn, *Agriculture in North Mamprusi*, Gold Coast, Department of Agriculture, Bulletin #34, 1937.

¹⁰⁰ S. Lynn Meaden, "The Long Garden Master: Charles Lynn, Agricultural Officer in the Gold Coast", in *African Research and Documentation*, 2010, p. 13. For more details on locusts, see Weiss, *Locust Invasions* cit.

¹⁰¹ Destombes, *From Long-Term Patterns* cit., pp. 190, 194.

¹⁰² See further Id., *Nutrition and Economic Destitution in Northern Ghana, 1930-1957. A Historical Perspective on Nutritional Economics*, Working Paper n. 49/99, London School of Economics, Department of History, London 1999, p. 25. Id., *From Long-Term Patterns* cit., p. 187-189.

¹⁰³ See Weiss, *Locust Invasions* cit.

¹⁰⁴ British National Archives, Kew (BNA) CO 96/738/14, AR NTs 1936. CO 98/74, AR NTs 1937.

short term, Lynn recommended increasing yields through more intensive manuring, with the manure supplied by bullocks that the farmers would be trained to keep in pens. In the long term, Lynn recommended increasing farm sizes to eight-to-twelve acres by introducing bullock-drawn ploughs. Lynn also suggested anti-grass burning bye-laws, and promoted the construction of dams for irrigation.¹⁰⁵

1940-1946

Weather conditions remained adverse during much of the 1940s, and the colonial government reported harvest failures almost every year until 1946, usually as a consequence of the rains being late and stopping early. The general food situation was further constrained due to the war economy introduced by the British colonial authorities in 1940. In particularly hard-hit districts, the local Native Authorities proclaimed a ban on the export of food crops, such as in Krachi, Wa, Lawra and Navrongo Districts in 1942.¹⁰⁶ In 1943, the Chief Commissioner himself issued an order forbidding any exports of food crops out of the Northern Territories.¹⁰⁷ After the “extremely bad harvest” of 1945 and a similarly critical situation in 1946, the colonial authorities recognized the need to give agricultural development and famine relief policies prime attention.

In 1940, Agricultural Director H.B. Waters proclaimed Lynn’s program “the best method” for overcoming “local famine” in a sustainable manner, and committed the Agricultural Department to implementing the mixed farming model.¹⁰⁸ During the 1940s, the Agricultural Department supplied bullocks and ploughs through the Native Authorities to farmers who demonstrated a commitment to fertilizing and conserving their land.¹⁰⁹ By 1950, there were 649 mixed

¹⁰⁵ Lynn, *Agriculture in North Mamprusi* cit., pp. 50-51. Lynn Meaden, *The Long Gardern Master* cit., p.13.

¹⁰⁶ BNA CO 98/79, AR Agricultural Department 1942-43, p. 1.

¹⁰⁷ BNA CO 98/79, AR Agricultural Department 1943-44, p. 2.

¹⁰⁸ H.B. Waters, “Review of Agriculture in the Gold Coast, 1940,” CO 96/773/19, pp.1, 5, 6.

¹⁰⁹ *Ibid.*, p. 22.

farmers across the Northern Territories.¹¹⁰ This was not an insubstantial number, but it represented only a small minority of farmers, and the Agricultural Department reported that many of them did not cultivate along the contours or use manure, which worsened soil erosion and led to poor harvests.¹¹¹ These results point to a lack of commitment on the part of the colonial government to the mixed farming program. As a result, the program did little to alleviate food insecurity in the Northern Territories. During the 1940s, in fact, the Native Authorities and government were forced to impose periodic ad hoc famine relief measures. In 1943, for instance, during a food shortage in Western Builsa, the Sandemnab (chief) and the Builsa Native Administration supplied the starving population with foodstuffs during the lean months.¹¹² In May 1944, the colonial administration in Mamprusi District reacted to the sharp increase in the price of millet by buying up rice and maize, and then selling it at controlled prices through the Native Administration.¹¹³ In June 1944 the colonial government, through its Agricultural Department, was for the first time engaged in the organization and provision of direct famine relief. Some 100 bags of rice and 220 bags of maize were imported by the Agricultural Department and distributed by the Mamprusi Native administration. The government also distributed petrol rations to lorry owners, allowing private merchants to bring food into the Mamprusi markets. Direct relief was also provided by the Agricultural Department in the East Tumu area in 1944, where about 350 people were given 240 bags of grain and 96 gallons of palm oil over a period extending from mid-March to the end of June.¹¹⁴ These relief measures validate Ofori-Sarpong's claim that the years between 1940 and 1945 were part of a dry period. District records also bear this

¹¹⁰ Gold Coast, *Department of Agriculture Annual Report, 1950-1*, Government Printer, Accra, 1951, p. 12.

¹¹¹ Id., *Department of Agriculture Annual Report, 1948-9*, Government Printer, Accra, 1950, p. 6. Id., *Department of Agriculture Annual Report, 1950-1* cit., p. 12.

¹¹² PRAAD/T NRG 8/3/127, AR Navrongo District 1943/44, para 59.

¹¹³ PRAAD/T NRG 8/3/137, AR Mamprusi District 1944-45, p. 8.

¹¹⁴ PRAAD/T NRG 8/37/1, CCNT to Medical Services, Accra, letter dated 5.2.1948.

out, with reports of rainfall failures between 1943 and 1945 in North Mamprusi, South Mamprusi and Wala.¹¹⁵

Problems continued, however, in 1946 when according to Ofori-Sarpong the rains should have recovered. In fact, low or uneven rainfall was recorded during the 1946 planting season in Navrongo, Mamprusi, and Wala.¹¹⁶ Early crops failed or were poor in many districts, resulting in acute food shortage in some locations in Dagomba as well as Northern Mamprusi and Navrongo.¹¹⁷ The problem was most severe in the northernmost areas, and in 1946 the government had to commence large-scale operations due to a desperate shortage of food there. From April to July, 1624 bags of maize were imported from Ashanti and together with 40 bags of guinea-corn were distributed in the Zuarungu, Kusasi and Navrongo Districts. A few months later, in September 1946, public famine relief was organized in the Konkomba areas; 159 bags of maize were dispatched to the area and sold at controlled prices in the markets.¹¹⁸ In addition, private traders delivered 5000 tons of foodstuffs to the Bolgatanga area. The severity of the situation prompted the Assistant Chief Commissioner to declare that in future the export of grain (apart from the export trade in rice and groundnuts which was to be extended) should be discouraged after a harvest failure. As private lorry owners and traders seemed to be capable of providing the main bulk of grain needed for consumption in the local markets, extra rations of petrol should be made available to those lorry owners who were willing to bring maize from the South to Tamale and further north.¹¹⁹

¹¹⁵ PRAAD/T NRG 8/3/127, AR Mamprusi District 1943-4, p. 7; PRAAD/T NRG 8/3/128, AR Wala District 1944-5, pp. 4, 9.

¹¹⁶ PRAAD/T NRG8/3/136, AR Mamprusi District 1945-6, p. 6; PRAAD/T NRG8/3/136, AR Wala District 1945-6, pp. 5, 6, 10.

¹¹⁷ PRAAD/T NRG 8/3/141, AR Dagomba 1946-47, para 31. PRAAD/T NRG 8/3/136, AR Mamprusi District 1941-945-6, pp. 3, 5.

¹¹⁸ PRAAD/T NRG 8/37/1, CCNT to Medical Services, Accra, letter dated 5.2.1948.

¹¹⁹ PRAAD/T NRG 8/37/1, File No. 0086, Memo of Asst CCNT 2.11.1948.

1947-58

Persistent food insecurity triggered a number of initiatives designed to increase production and prevent famine. On the productive side, the mixed farming program continued but the administration supplemented it with two new projects: land planning in the upper regions and large-scale mechanized farming in the Northern Region (Gonja). Land planning grew out of the Mamprusi Forestry Conference in 1947, during which the Forestry Department suggested relocating most of North Mamprusi's population (500,000 people) to less densely populated areas to make way for a series of forest reserves. The Chief Commissioner rejected this idea and instead designated the proposed Headwaters Reserves as "land planning areas". The program was designed "to plan the development of agriculture, forestry and water supplies ... to ensure maximum conservation of water supplies and to prevent soil erosion".¹²⁰ Land planning targeted the areas deemed overpopulated, especially the North Mamprusi and Wa Districts. Beginning in 1948, the Government surveyed the targeted watersheds and divided the land into forest reserves ("watersheds and steep slopes") and arable areas ("gentler slopes and valley bottoms").¹²¹ In the arable areas, the administration separated farming from grazing land and provided dams, irrigation schemes, contour terraces and other conservation works.¹²² The government initially created separate North-Western and North-Eastern Land Planning Committees, but they were combined in 1953 into a Central Land Utilization Committee with statutory powers under the Land Planning and Soil Conservation Ordinance of the same year. The Central Committee administered six land-planning areas spread across the north-west and north-east.¹²³

¹²⁰ Gold Coast, *Department of Agriculture Annual Report, 1947-8*, Government Printer, Accra, 1949, pp. 7, 11-12.

¹²¹ Id., *Department of Agriculture Annual Report, 1950-1* cit., p. 11.

¹²² Id., *Department of Agriculture Annual Report, 1952-3*, Government Printer, Accra, 1954, p. 13. Id., *Department of Agriculture Annual Report, 1954-5*, Government Printer, Accra, 1956, p. 19.

¹²³ Grischow, *Shaping Tradition* cit., pp. 147, 176-86. T.E. Hilton, "Land Planning and Resettlement in Northern Ghana", in *Geography*, 44, 4, 1959, pp. 232-233.

The second productionist response to food insecurity was a massive scheme to develop mechanized cash-crop farming in the Gonja area of the Northern Province. The scheme was large (1 million GBP initial capital) and the Government delegated its management to a quasi-public entity, the Gonja Development Corporation.¹²⁴ The project envisioned producing groundnuts and other export crops on formerly unoccupied land around Damongo, not far from Tamale. This required settlers, which provided an opportunity to relieve North Mamprusi of some of its “surplus” population by resettling 80,000 individuals to the Gonja site.¹²⁵ The peasants would be resettled in family and community groups, complete with traditional leaders and religious shrines. Production would be organized collectively with the peasants required to work together on communal farms large enough for mechanized cultivation. At the end of the day the farm workers would return home to their new villages where each would have a small subsistence plot.¹²⁶ By the mid-1950s, the Gonja Development Corporation had attracted fewer than 4,000 settlers to this scheme, and tobacco had emerged as the only viable and marketable crop. This did not bode well, and in 1956 the company was liquidated, having achieved very little in terms of agricultural development.¹²⁷ Enjoying more success was the Gonja Development Corporation’s construction arm, which hired itself out to clients, including the Land Planning Committees, who needed heavy equipment to construct soil conservation works. Thus, while the Gonja project was failing, land planning proceeded apace and the number of mixed farmers grew steadily, reaching 2012 by 1957.¹²⁸ At this level, though, mixed farmers represented only three per cent of the total farming population of the North.¹²⁹ Also, the Agricultural De-

¹²⁴ BNA CO96/554/459, *Gold Coast Daily Echo*, 26 January 1950.

¹²⁵ Grischow, *Shaping Tradition* cit., pp. 212-17.

¹²⁶ See for example G.L.M. Clauson, minute on S.S. Murray, “The Organisation of Agriculture in the U.S.S.R.”, 23 July 1943, CO852/402/1, PRO. I thank Dr. R.W. Shenton for bringing this file to my attention.

¹²⁷ La Anyane, *Ghana Agriculture* cit., pp. 170-1.

¹²⁸ Gold Coast, *Department of Agriculture Annual Report, 1956-7* cit., p. 6.

¹²⁹ Id., *Department of Agriculture Annual Report, 1954-5* cit., p. 20. Id., *Department of Agriculture Annual Report, 1956-7* cit., p. 6.

partment reported that many of the plough farmers did not cultivate along contours or use manure, which worsened soil erosion and led to poor harvests.¹³⁰ As a result, the North remained just as prone to food shortages as it had been in the past. Between 1936 and 1957, the Department of Agriculture reported food shortages in thirteen years in all or parts of the North.¹³¹

Apart from the productionist schemes, the Northern administration continued to discuss famine relief and prevention measures between 1947 and 1958. Most significantly, in 1947 Chief Commissioner W.H. Ingrams initiated a debate over whether to revise and systematize the existing famine relief schemes. Ingrams had recently visited the French Niger Colony and was 'impressed' by a system of village granaries that the French colonial government had required the people to build to store a year's supply of food.¹³² After his return, Ingrams sent a message to all District Commissioners in the Northern Province asking them about the possibility of establishing a similar system.¹³³ Ingrams believed that the farmers were selling rather than storing their surpluses, and he wanted to establish a village-based, or – depending on local customs – compound-based grain storage system. The system would be administered by the Native Authorities run by the chiefs.¹³⁴ The answers from the District Commissioners came as a surprise: in most of the households such granaries already existed. The problem was not that households were not able to store grain, the Assistant Director of Agriculture remarked, but that in most cases they were not able to store for more than one year in advance.¹³⁵ Ingrams was not convinced, and

¹³⁰ Id., *Department of Agriculture Annual Reports, 1948-9* cit., p. 6. Id., *Department of Agriculture Annual Reports, 1950-1* cit., p. 12.

¹³¹ The Annual Reports mention food shortages in various locations during the following years: 1936-7, 1937-8, 1938-9, 1939-40, 1940-1, 1943-4, 1944-5, 1945-6, 1946-7, 1948-9, 1953-4, 1954-5, and 1956-7.

¹³² On French policies in Niger, see F. Fuglestad, *A Political History of Niger 1850-1960*, Cambridge University Press, Cambridge 1983.

¹³³ PRAAD/T NRG 8/11/13, CCNT letter dated 13.8.1947.

¹³⁴ PRAAD/T NRG 8/11/13, CCNT letter dated 13.8.1947.

¹³⁵ PRAAD/T NRG 8/11/13, Letter from the Asst. Dir. of Agriculture to CCNT, 4.11.1947.

pursued the question of a famine relief levy throughout 1947 and 1948. During this period the North continued to suffer from low rainfall and food insecurity, at a time that Ofori-Sarpong refers to as very good for rainfall. In 1947, for instance, Western Dagomba and Gonja suffered from drought conditions, producing crop failures and food shortages. Similar problems hit Mamprusi in 1948.¹³⁶

The outcome of the 1947-48 discussions was a scheme controlled by the government, not the Native Authorities, which rested on the combination of early warning systems, infrastructure and agricultural development, as well as relief measures.¹³⁷ The key element was the early warning system, which was based on monthly reports on weather, planting, harvest, market prices and provision of food that were prepared by the Agricultural Department.¹³⁸ The key to the system was the collection of monthly reports from all districts, which would enable the colonial government to make preparations for future actions such as food storage in village granaries. In order to construct a longer timeline with more predictive value, agricultural officials also combed through Annual Reports to obtain past monthly data on rainfall and harvests. To strengthen the position of the desperately understaffed Agricultural Department in the Northern Territories, Mr. C.L. Skidmore was appointed by the Department for Rural Development as Commissioner for Food Production in the North.¹³⁹

By the late 1940s, the early warning system was fully implemented and monthly reports about the advance of the farming season were prepared beginning in 1948. The system was first put to the test in 1951, when the harvests of the main crops (guinea-corn and millet) were poor or below average due to an exceptionally wet rainy season, especially in the northeastern part of the territories. Market prices in Tamale reached alarming highs by October 1951 (up from

¹³⁶ PRAAD/T NRG8/3/141, AR Western Sub-District of Dagomba 1946-7, p.4. PRAAD/T NRG8/3/145, AR Gonja District 1946-7, p. 4. PRAAD/T NRG8/3/160, AR Mamprusi District 1948-9, pp. 8, 13, 16.

¹³⁷ A detailed outline of the debate is provided by Weiss, *Crop Failures* cit.

¹³⁸ These reports are found in PRAAD/T NRG 8/3/301.

¹³⁹ PRAAD/T NRG 8/11/13, Letter dated 15.9.1949.

70/- [70 shilling] for one bag of millet in August 1951 to 105/- per bag of millet in October; similar increases reported for other grains) and remained high for two months, but had substantially decreased by March 1952 (millet down to 85/- per bag).¹⁴⁰ Worried by a threatening shortage of food, the Native Authorities of the Kusasi Sub-District prohibited the export of maize. In the rest of the Protectorate, the colonial authorities did not expect any food shortages, as harvests were generally reported to be “satisfactory” and “up to average.”¹⁴¹ A few months later, the export ban on grains from Kusasi was critically evaluated as it turned out that the adjacent Frafra and Kassena-Nankanni Sub-Districts – both importers of Kusasi grains – were suffering greatly from its effects. This led to a relaxation of the ban in February 1952.¹⁴² However, the situation in the area remained critical, and in June 1952 the Kusasi Native Authority renewed the export ban. This time the colonial administration rejected the intervention from the outset, arguing that the other two Sub-Districts, which still faced critical food shortages, would suffer once again. Criticizing the local Native Authority for acting out of “parochial selfishness”, the colonial authority had the ban lifted by July 1952. At this point, the rains had been “satisfactory” and “well distributed” and a satisfactory harvest was anticipated.¹⁴³ One month later, the forecasts were much bleaker as a dry spell occurred in early August. The rains, however, returned and both the early and the late crops were “satisfactory”. No ban on crop exports or famine relief measures had to be considered.¹⁴⁴ A difficult and complicated

¹⁴⁰ Data on Tamale market prices are included in the Monthly Food Production Reports, PRAAD/T NRG 8/3/301.

¹⁴¹ PRAAD/T NRG 8/3/301, Monthly Food Production Report, October 1951, November 1951, sheets 60, 62.

¹⁴² PRAAD/T NRG 8/3/301, Monthly Food Production Report, February 1952, sheet 71.

¹⁴³ PRAAD/T NRG 8/3/301, Monthly Food Production Report, June 1952, sheet 76.

¹⁴⁴ PRAAD/T NRG 8/3/301, Monthly Food Production Report, July 1952, August 1952, September 1952, October 1952, December 1952, sheets 78-82, 221, 224.

picture emerged one year later. Although the rainy season of 1953 had been an uneven one, crops had been generally “satisfactory,” with the exception of those in the Kassena-Nankanni and the Builsa Sub-Districts. Here, food shortages were anticipated for the dry season as food supplies were expected to be largely exhausted by January 1954.¹⁴⁵ In December, the colonial authorities decided to store 50 tons of guinea corn at Damongo to be released “when and if required”.¹⁴⁶ The affected districts remained under observation for the next months. By April 1954, the collection of famine foods was reported but a subsequent report declared “the usual pre-harvest hunger will probably be more marked than usual, but that there are no real grounds for using such words as ‘famine’ and ‘precarious’”.¹⁴⁷

The situation remained problematic in the northeastern part of the territories for the following years. Although the year 1954 meteorologically was a very dry year (see Table 3), both the early and the late harvests were “generally good” in all other parts, except for the Builsa and Frafra Districts. Although market prices at Tamale again soared – for example, millet from 75/- per bag in April 1954 (June: 80/-, July and August: 72/-) to 95/- per bag in October – the good harvest soon brought down market prices (December 1954: 78/- per bag of millet). In the northeast, on the other hand, “normal food-shortage” was occurring in the “over-populated and eroded parts of Northern Mamprusi”.¹⁴⁸ In June 1955, inadequate supply of food-stuffs in the Frafra and Kassena-Nankanni Sub-Districts was anticipated, and in November of the same year a similar picture to the year before prevailed: while the rest of the Protectorate had a good harvest, parts of the Kassena-Nankanni Sub-Districts suffered from

¹⁴⁵ PRAAD/T NRG 8/3/301, Monthly Food Production Report, October 1953, November 1953, sheets 237, 239.

¹⁴⁶ PRAAD/T NRG 8/3/301, Monthly Food Production Report, December 1953, sheet 241.

¹⁴⁷ PRAAD/T NRG 8/3/301, Monthly Food Production Report, March 1954, April 1954. Report on supply on food stuffs, Government Agent’s Office Mamprusi District, 14.5.1954, sheets 248, 251, 253.

¹⁴⁸ PRAAD/T NRG 8/3/301, Monthly Food Production Report, June 1954, October 1954, November 1954, sheets 256, 270, 272.

poor crops and “there the food shortage [was] likely to be as acute as usual”. The price of millet at this point had fallen to 45/- per bag at the Tamale market.¹⁴⁹ By February 1956, food supplies in Kassena-Nankanni started to dwindle at an alarming rate and in March the government brought in grain from the Gonja Development Company and sold it at fixed prices at the Navrongo market.¹⁵⁰

As part of the famine prevention plan, the government also carried out experiments in food storage in various districts.¹⁵¹ Soon, however, the Chief Commissioner had to inform Accra that the general scheme of foodstuff storage for emergencies could not be realized according to its original plans. The main problem was that the village stores had not received popular approval and tended to fall into disuse. In 1952, the Chief Commissioner wrote that the main reason for the unpopularity of the village storage system was that it did not improve the situation of people suffering from a bad harvest.¹⁵² But the early warning system initially remained in place after the independence of Ghana on March 6, 1957, and it helped to avert a disaster in 1958 when a severe drought hit Northern Ghana and spoilt almost all of the crops.¹⁵³ By August 1958 it was clear that the outlook was catastrophic. Fortunately, public preventive actions had already been outlined,¹⁵⁴ and a detailed plan of action was

¹⁴⁹ Monthly Food Production Report, November 1955, PRAAD/T NRG 8/3/301, sheet 291.

¹⁵⁰ Monthly Food Production Report, February 1956, March 1956, PRAAD/T NRG 8/3/301, sheets 297, 298.

¹⁵¹ PRAAD/T NRG 8/11/13, Acting CCNT to Colonial Secretary, Accra, letter dated 28.4.1950.

¹⁵² PRAAD/T NRG 8/11/34, CCNT to Permanent Secretary, Ministry of Agriculture and Natural Resources, letter dated 21.3.1952.

¹⁵³ In 1953 food shortages were reported from North Mamprusi, especially in the Kassena, Nankanni and Builsa regions. The actions taken by the government largely followed those discussed in the various meetings: close monitoring of the progress of the harvest and food situation in the affected areas as well as the purchase of grain and its sale at fixed prices. See further PRAAD/T NRG 8/37/1, sheets 27-75.

¹⁵⁴ PRAAD/T NRG 8/11/34, Principal Medical Officer to Regional Commissioner, letter dated 1.8.1958, Acting Secretary to the Regional Commissioner to the Permanent Secretary, Ministry of Agriculture, Accra, letter dated 7.8.1958.

presented by mid-August.¹⁵⁵ On the 20th of August, the Ghanaian government appointed a special Food Commissioner with full responsibilities for assessing the situation, organising the transfer of food from areas within Ghana to the affected regions, and advising on emergency food imports if needed.¹⁵⁶ A “limited” state of emergency was declared and all exports of foodstuff were banned. During the next months, famine relief was organized, and the Ghanaian government purchased grain and sold it at fixed prices during autumn 1958.¹⁵⁷ Then, in the spring of 1959, the government received a substantial shipment of maize as a gift from the United States. This enabled the government to continue the sale of grain in the Northern Region until June 1959. Government and US grain was still in stock in November 1959, when it was decided to sell the remaining grain because the North had a good harvest that year.¹⁵⁸ The colonial early warning system had averted a potential catastrophe.

Conclusion

The historical narrative discussed above leads to several conclusions. First, regional rainfall data are problematic as an indicator of harvest failures. Most importantly, while regional data on dry periods corresponds roughly to colonial reports of food shortages, some apparently “dry” periods did not produce harvest failures, while conditions approaching famine were reported during years that should have been “wet”. The correlation between regional dryness and harvest failures is strongest for the period 1900-1920. Nicholson and

¹⁵⁵ PRAAD/T NRG 8/11/34, Memorandum for Discussion in the Regional Office with the Minister of Agriculture and his Permanent and Parliamentary Secretary at Tamale on 14.8.1958, Concerning the Threatened Food Shortage in the Northern Region.

¹⁵⁶ PRAAD/T NRG 8/11/34, Ministry of Agriculture, letter dated 20.8.1958.

¹⁵⁷ The files on government actions during the autumn of 1958 are found in PRAAD/T NRG 8/37/3.

¹⁵⁸ The files on government actions during the spring of 1959 are found in PRAAD/T NRG 8/37/4.

Ofori-Sarpong identify dry periods during these years in the Sudano-Guinea Zone and Northern Ghana specifically, and colonial reports indeed mention poor harvests in 1912, 1914, and 1920. *There is also a correlation between Ofori-Sarpong's identification of an anomalous dry period between 1957 and 1960 and the severe drought in Northern Ghana of 1958.* However, the colonial government did not report harvest problems between 1935 and 1945, which Ofori-Sarpong identified as dry, and there were reports of famine conditions during the supposedly wetter years of 1922, 1930-1, and 1946-8.

Part of the problem in correlating regional data with harvest failures is the existence of local variations, identified by H.O. Walker as early as 1957. As we have seen, Barbé, Lebel and Tapsoba fit these variations into a pattern of multiple "rain maxima" (three in the Northern Region and two in the Upper Regions), as opposed to the accepted notion of a single rainy season between April and September. Even if we accept this broad pattern, however, it still overlooks significant variability in microclimates. For instance, our data on Navrongo and Tamale reveals a lack of predictable patterns in either the onset or the progress of the rainy seasons between 1952 and 1960. In these locations, there were no "normal" or "average" years at the micro-level. This goes some way towards explaining why there could be local reports of famine conditions when rainfall was adequate at the regional level. Even during a good year, farmers at specific locations could have been faced with low total rainfall or poor timing (for instance, failure at the beginning of planting seasons). Beyond this, we also have shown that excessive rainfall could affect crops as well. Furthermore, there were factors unrelated to rainfall, such as locust invasions, disease/epidemics, and the development of trade, all of which affected harvests at various times. The lesson is that harvest failures did not necessarily correlate with low rainfall at the regional level.

Second, we have shown that the colonial government responded to harvest failures beginning in 1930, and that some successes were achieved. Early policies included government famine relief, state support for private famine relief, trade embargos, depopulation through resettlement, and the development of mixed farming.

In 1944, and especially in 1946, privately owned lorries delivered badly-needed food supplies to North Mamprusi, and were successful enough to prompt the government to subsidize fuel costs for private relief efforts. During the 1940s and 1950s, mixed farming worked when it could be supported and monitored, as evidenced by its growth in the Upper East in particular. These successes, however, were incomplete. Mixed farming never reached more than a small percentage of the total peasant population, and it was eclipsed in the late 1940s by the massive (and ultimately unsuccessful) Gonja Development Scheme. Direct relief, of course, was never more than a patchwork solution after the fact, and as such could not be relied upon to remedy the situation permanently. Beginning in the late 1940s, the colonial administration pursued a new program of land planning as a long-term strategy for averting food shortages and famine. Despite the demarcation of several large land planning areas, however, this program did not deliver on its promises and fell apart by the early 1960s.

Third, we have identified the late 1940s as a turning point because of the development of an early warning system, the most innovative colonial policy in response to harvest failures and food insecurity. Prompted by Ingram's ideas about granaries, the colonial administration developed a government-controlled scheme based on monthly reports from the Districts relating not only to weather and harvests, but also to market prices and food supplies. These reports were combined with historical data gleaned from Annual Reports, and the entire system was centralized in the hands of a new Commissioner for Food Production. During the early 1950s, the administration used the early warning system to make decisions about trade embargos (1952), and to buy up grain supplies to store as famine foods (1954). But the most important instance of early warning as a preventative tool occurred in 1958, when the government predicted a major problem and drew up a detailed plan to fend it off through famine relief. This intervention can arguably be seen as an effective colonial policy in response to harvest failures.

The success of the 1950s, however, was very short-lived. In 1961, the Upper Region once again faced a harvest failure, yet this time

government actions only started when rumours of an impending food scarcity reached the Chief Agricultural Officer:

It appears there will be shortage of food and water in the Northern and Upper Regions next year [1962]. *Though no figures are available* [sic!] to support this statement, the condition of crops in the fields particularly in parts of the Upper Region points to such a gloomy forecast.¹⁵⁹

The difference between 1958 and 1961 is appalling. Whereas in 1958 the Agricultural Department was constantly aware of the crop and food availability situation thanks to monthly reporting, such reports no longer seem to have existed in 1961. Thus, it was the Chief Agricultural Officer who had to order an investigation into the state of affairs and ask for an assessment by officers to start, if necessary, plans for famine relief. Such reports were eventually presented by the Regional Commissioners of the Northern and Upper Regions.¹⁶⁰ Some actions were taken during the first part of 1962, yet the available archival files seem to indicate that the earlier, rather well-organised system, had disappeared. The most striking difference with the crisis of the 1950s is that no monthly or progress reports were produced. One might even argue that the decision-making officials were not in contact with their subordinates much of the time, or did not know about the actual situation in the affected localities. The lack of a plan is illustrated by a note received by the secretary of the Regional Commissioner Tamale from the District Commissioner Damongo. “I shall be grateful”, Damongo wrote, “if *you will use your good influence* (emphasis added) to procure foodstuffs from other parts of the country so that they can be transported to the villages mentioned in this letter”.¹⁶¹ Such informal requests were to become common during the 1960s.

By this time it seems as if food shortages in Northern Ghana had

¹⁵⁹ PRAAD/T NRG 8/37/4, Restricted and Urgent, Chief Agricultural Officer, Ministry of Agriculture 16.11.1961, sheet 912.

¹⁶⁰ PRAAD/T NRG 8/37/4, sheets 914-915 and 918.

¹⁶¹ PRAAD/T NRG 8/37/4, DC Damongo to Secretary RC Tamale, May 1962, sheet 934.

less to do with the factors we have identified than the gradual erosion of the Ghanaian economy at large and the failure of agricultural development in the North in particular. In 1957, Kwame Nkrumah became the first Prime Minister after decolonization. Although Nkrumah inherited the colonial system and the early warning system, he prioritized cash crop production (especially cocoa) over food crops. By 1961, however, cocoa prices had fallen drastically and the Government was faced with declining reserves, and a population demanding the benefits of a welfare state promised by Nkrumah in the early years of his rule. Nkrumah responded with a plan for rapid, state-directed industrialization, controlled politically by constitutional reform that turned Ghana into a one-party state. In agriculture, the plan centered on large-scale mechanized state farms managed by various organizations linked to Nkrumah's Convention People's Party (CPP). This initiative failed, producing "negligible" results despite massive investment.¹⁶² Nkrumah also launched two irrigation projects in the Northeast in the hopes of increasing production, of tomato and rice in particular. However, these projects were designed to force peasants into cash crop production for markets abroad and in southern Ghana rather than increasing foodstuff production for the North. This project also failed. Peasants were forcibly resettled as the state expropriated their lands. According to Konings, the project resulted in "the almost total destruction of the domestic community's food production".¹⁶³ By then it appears that the CPP had abandoned the early warning system that had worked successfully in 1958. Eventually the CPP's development failures and political authoritarianism prompted a military coup in 1966, followed by a succession of military governments during the 1970s. As we have seen above, these governments also failed to address food insecurity in Northern Ghana, and this prompted scientists such as Ofori-Sarpong to revive the notion of an early warning system as a proactive measure against famine in the Sudano-Guinea zone. Current research recapitulates colonial debates about agricultural de-

¹⁶² Beckman, *Ghana, 1951-78* cit., pp. 147-8.

¹⁶³ Konings, *The State and Rural Class Formation* cit., pp. 270, 326.

velopment, land planning, and depopulation/resettlement; but this recapitulation is being carried out in the absence of historical memory, without realizing that virtually all of the alternatives had already been considered by the colonial administration between 1930 and the 1950s. This current literature, we believe, would benefit from digging further into the colonial past.